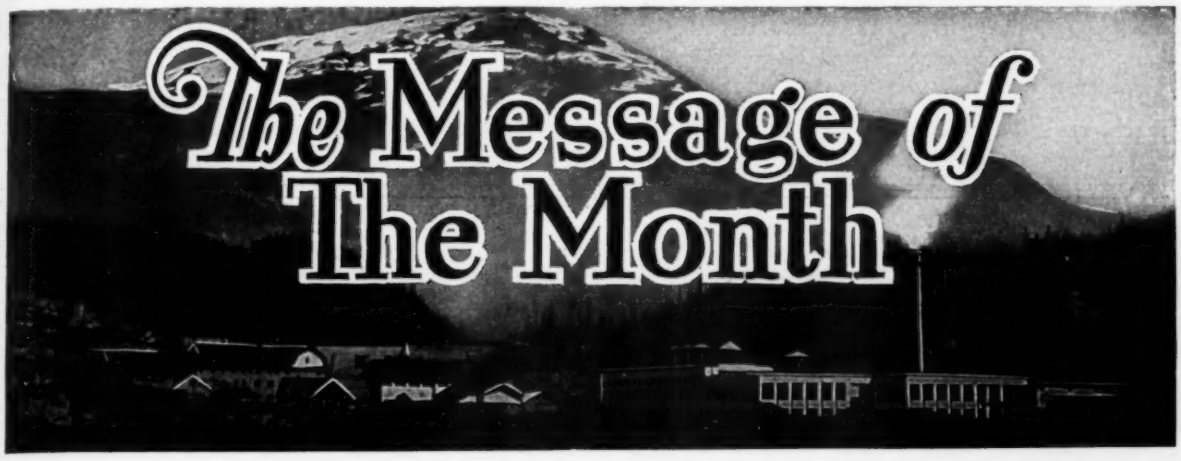


How Can We Sell Our Surplus Products?

MR. OWEN D. YOUNG of domestic and foreign reputation, than whom no man in the world has a finer fame for solving intricate local and world problems, has recently written a succinct analysis of the acute industrial crisis we are just now going through.

The one question which he thinks involves all the basic economic problems of America, and affects the interests of all the people in the United States is—"How can we sell the surplus of what we produce?"

First of all, he brings us bang up against the indubitable fact that we are a surplus-commodity-producing nation, and that the non-disposal of these surpluses is the cause of all our ills.

And, secondly, that other great nations of the world also are surplus-commodity producers, and that most every other country on the globe is struggling with the same great economic disaster, the disposal of surplus commodities—viz: Argentine and Canada with their surplus agricultural products, Brazil with surplus coffee and beef, Japan with its surplus silk, Scandinavia and Soviet Russia with their surplus wood products (of which we have knowledge, especially Soviet pulpwood), Germany, France and England with their surplus manufactured commodities, Russia again with her surplus mineral and oil products, Africa with surplus diamonds, India and Egypt with their surplus cotton, the South Sea lands with their surplus rubber, all seeking to dump their various surpluses in this country or on each other.

"How can we sell the surplus of what we produce?"

Mr. Young shows that we can't. At least not now nor in time to give us speedy relief from the major business recession into which our foolish mass production policy of the past decade has plunged us.

There are six fields in which we produce more commodities than our own people buy or than we can sell to the people of other lands; namely, products of agriculture, our mines, our forests, our manufacturing industries, the services of our technical skill and our savings for investment.

In trying to answer the question of how can we sell the surplus commodities, he says: "Well, what shall we do with our surplus of wheat and cotton?" He sees only two ways of getting rid of it—"either we must burn it at home or sell it abroad." But he warns us "if America starts to burn surplus wheat when people are hungry elsewhere, or burns surplus cotton when people are underclothed elsewhere in the world, that fire will start a conflagration which we cannot stop. There is no way out except to market the surplus where men are hungry and underclothed."

But how can we **sell now** the surplus of what we produce?

It is not being done to-day—we must do it soon. It can be worked out. It is nothing more than a

E D I T O R I A L

maladjustment of social, political and economic machinery.

With the pressing necessity for remedial procedure upon us, we rise right here to ask consideration of this pertinent question:

"Why produce a surplus?"

Since the world trade conditions to-day make it impossible to market or even dump our surplus production of commodities abroad, and we have but one other way of ridding ourselves of these burdensome surpluses—namely, "burning them at home"—why then produce a surplus?

In order to give you a concrete case at point, we want to take you now out to the State of Kansas.

Kansas has a surplus crop of wheat. Prices are down to pre-war levels. They cannot sell or dump it abroad. They won't burn the surplus.

A few weeks ago, a meeting was held at Dodge City, in that State, of some two thousand bonanza wheat farmers. To that meeting came from the East, a lone, sane, straight-thinking, hard-headed, sympathetic, American business man named Legge.

This man had the supreme nerve and uncommon good sense to say in substance something like the following to those hard-headed, hard-working toilers of the wheat plains:

"You farmers of Kansas want profitable prices for your wheat, don't you?"

And they unanimously allowed they did.

"Well," said Mr. Legge, "I'll tell you how to do it."

"Say how," they demanded.

"Raise less wheat"! was the reply.

And then, that sturdy, courageous apostle of sound economics got down to brass tack talk with those denizens of the Kansas farms.

He debunked the political pap they had been fed.

He told them bluntly, plainly and with conviction that their congressional advisors were all wet when they told them to "raise all the wheat you can and the Government will create a good market for it and buy your surplus at a good price."

He made them fully and finally understand that neither this nor any other government on earth could reverse the law of demand and supply—when they produced more wheat than the world could eat, the price automatically went down and nothing nor nobody could stop it.

And, we believe agriculture will follow the leadership of Mr. Legge—curtail their overproduction and correct their profitless situation into profitable industry by ceasing to produce a surplus. For Kansas will never embrace a surplus wheat-producing cartel which has for its ultimate the burning of their surplus to get rid of it.

For surplus Kansas wheat cannot be dumped anywhere on earth but in Kansas.

Then, why produce a surplus?

And why produce a surplus of paper?

There is no place on earth that the surplus paper can be dumped and mayhap some of the surplus stock we have recently heard of may be burned.

Any way, it's the price at which the surplus is sold that determines the market for the entire output.

Then, why produce a surplus?

The surplus of 30 per cent sets the market for the 70 per cent that is sold.

The surplus cannot be sold, but the pressure of it on the market sets profitless prices for the whole consumption.

Paper is a precious product—it is the essential product necessary to the world's progress and its profits are essential to the country's economic development.

The paper industry has at this acute time, the problem of surplus product in common with every other division of industry in this country.

The immediate call is for an immediate correction of its surplus production. Each industry must curtail production and as each industry does curtail its overproduction, surpluses will disappear and demand will reappear which will permit each industry to make its just profit and thereby contribute its share to the return of stable and prosperous American business.

Surplus production killed the goose that laid the golden egg.

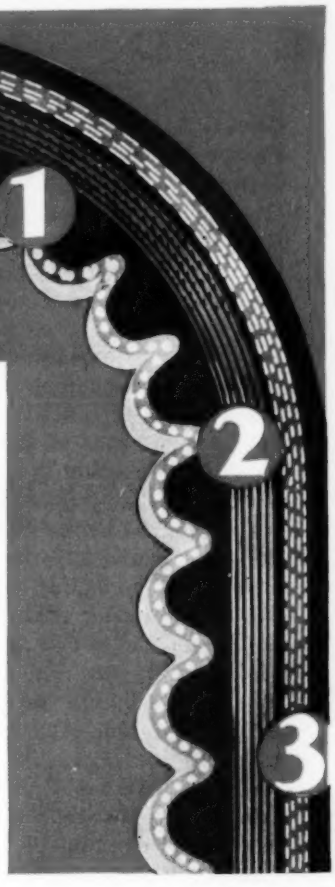
Curtailed production will start her laying golden eggs again.

World's Production and Trade in Paper

THE consumption of paper in a country affords an index of the cultural advancement as well as the industrial progress of its inhabitants, so it is of interest to compare the position of the United States in the paper industry of the world. **Consumption** of paper per annum of ten leading countries is estimated by the American Paper and Pulp Association from a compilation of official reports as follows:

United States	11,943,174
Great Britain	2,025,367

Here's one reason why the Dayton Cog-Belt *is the Greatest V-Belt Ever Built*



The Cog Section of Dayton Cog-Belts goes right to the root of efficient V-Belt power transmission. Look at the illustration.

. . . And *without stretching.* It stays *permanently* stretched in the finished belt.

Moreover, no other V-Belt is laminated and die-cut in its finished state. Daytons *remain* accurate . . . give truer alignment . . . have a firmer grip in the pulley grooves due to their raw edge contact-driving surface. They don't slip... require less maintenance and have longer life. They operate under less tension to transmit the maximum horsepower.

Get complete information about these amazingly efficient belts. Send for the Dayton Cog-Belt catalog and a sample section of the belt today.

THE DAYTON RUBBER MANUFACTURING CO.
Dayton, Ohio

Factory Distributors in Principal Cities and all Westinghouse Electric and Manufacturing Company Sales Offices

Dayton
COG-BELT DRIVES

1 The *cog construction* of Dayton Cog-Belts not only increases flexibility but does away with buckling, "rippling," "creeping" and lateral distortion, or bulging. Daytons run cooler and therefore last longer. The cog section is composed of specially processed, fibre-reinforced rubber, giving a cross-wise rigidity not found in any other V-type belt.

2 The central, *"neutral axis"* is the strength section. Non-stretchable. Built of cord fabric and vulcanized under tremendous tension. Extends across the entire width of the belt. Completely balanced. No displacement, no weaving, no twisting in the grooves possible.

3 The *outer section* is built of bias-cut fabric to accommodate bending without strain or distortion. This is another reason why Daytons do not heat, have greater pulling capacity, require less maintenance and last much longer than any other V-type belt.

O-91

Complete Drives—Pulleys and Belts in Stock—all Ratios 2 H. P. to 100 H. P.

E D I T O R I A L

Germany	1,627,921
France (1926)	773,658
Japan	598,865
Canada	570,153
Italy	423,055
Russia (1927-1928)	401,898
Sweden	170,683
Poland	157,958

Except for France and Russia, where the figures represent consumption for 1926 and 1927-28 respectively, the statistics of consumption of paper in short tons of 2,000 lb. is for the year 1927. It is interesting to note that with a production of 10,002,070 tons and a consumption of 11,943,174 tons, the United States imported 2,068,973 tons of paper and exported 127,869 tons.

The entire production of paper in all countries of the world during 1927 was approximately 20,946,972 tons, and of this amount the United States made about 50 per cent of the total, but when imports of paper into the United States are taken into consideration, the consumption of paper approaches the high sum of 57 per cent of the world's production.

The figures of consumption for the ten leading producers of paper in the world reproduced above reveal some curious contrasts. Thus the United States, with a production of 10,002,070 tons, consumes 11,943,174 tons of paper. Canada's production of paper, more than half of which is exported, bears a corresponding relation in its figures of consumption, being sixth on the list of nations as to quantity of paper consumed, with 570,153 tons. Germany, the third nation in quantity of paper manufactured also stands third in consumption, the respective figures being, 2,190,300 and 1,627,921. France, a great cultural nation, but with a population lower than Germany by 21,000,000, stands seventh in consumption of paper, with 773,658 tons to her credit, but she is fifth in production, with only 628,311 tons reported for 1926.

Taking fourth place in production is Great Britain, with 1,649,760 tons, but Great Britain occupies second place among the nations of the world as regards consumption of paper, its consumption for 1927 being estimated at 2,065,367 tons, with imports of 617,362 tons and exports of 241,755.

Canada leads the world in exports tonnage, with shipments of 1,948,538 tons reported for 1927. Sweden is a large producer of paper, being sixth in rank, with 584,249 tons, but the consumption of paper in that country of comparatively small population is low at 170,683 tons.

Japan shows an increasing consumption of paper annually, production and consumption being nearly equal. Although seventh in the rank of producing countries, with 575,758 tons, Japan is fifth in the list of consuming countries, using more paper than is produced, or 598,865 tons, making it necessary to import 69,146 tons, with exports of paper amounting to 46,039 tons for the period under review.

Italy produced 400,962 tons of paper and consumed 423,055 tons, which places her seventh on the list of consuming countries, but Italy imports considerable paper, the total amounting to 38,157 tons, while her exports are lower than one would expect, amounting to only 16,064 tons, the bulk of which is likely to be the fine handmade paper for which the country is noted.

Finland, with a consumption of 66,142 tons, produced 310,399 tons of paper, and imported 1,566 tons, but had an export outlet of 245,813 tons.

Czechoslovakia gives indication of a rise among the nations of the world, with a paper consumption of 80,550 tons and a production of 242,506 tons, while her exports show growing importance, the figure for 1927 being 169,131 tons; it is significant that her imports of paper amounted to 7,175 tons which indicates her cultural advancement, for it may be compared with Newfoundland's production of 202,852 tons, 188,453 tons of export, 1,000 tons of import and a consumption of only 15,899 tons. Here allowance must be made for the smaller population of Newfoundland as compared with that of Czechoslovakia.

The output of paper showed a fourfold growth in the period from 1900 to 1927, the production in 1900 being estimated at 5,000,000 tons. In only one of the countries concerned, Canada, has the increased production depended wholly upon increased use of domestic materials, though in the United States there has been a marked increase in the use of domestic wood for paper manufacture.

In the very informing account of world production of paper, published in the **Weekly Business Review** of the American Paper and Pulp Association, from which most of the foregoing statistics have been obtained, the observation is made that further increased use of paper in the United States, which is now three times that of any other country, may slow up. "The rising tide of business activity and cultural development throughout the world indicates that its position may be threatened." Hence it is urged that means should be taken to share in the rapidly growing trade of the world through carefully planned foreign trade extension.

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The Paper Trade of Uruguay

By WILBUR T. GRACEY

This is the third of a series of articles specially prepared for us by Mr. Gracey, who was for over twenty years an American Consul in Latin America and other parts of the world. Mr. Gracey speaks Spanish and several other languages, and during his term as consul was a prolific contributor to "Commerce Reports," has done much constructive work for the Government and American manufacturers and been successful in placing many firms in contact with trade opportunities abroad.

WHILE Uruguay is the smallest of the South American republics, it is so densely populated that the people have a larger per-capita purchasing power than any other country in South America, with the sole exception of the Argentine.

About the size of the state of Nebraska, Uruguay has a population of nearly a million and a half; chiefly whites and mestizos—the latter a mixture of Europeans and native blood—and about 100,000 native Indians. Nearly a third of the people reside in the national capital Montevideo.

Like the Argentine, Uruguay's exports consist principally of animal products, which are shipped entirely through the single port of Montevideo, and this city is also the center of the industrial life of the country.

The manufacturing enterprises are growing constantly. Many products formerly imported are now being made in the country, while large packing houses prepare meat products for exportation.

All of the paper and paper products which enter Uruguay enter at the port of Montevideo, and much of the paper destined for River Plate places in Paraguay are transferred here.

Railways operate to interior cities, but none of these places are important to the paper trade.

As there are daily steamship connections with Buenos Aires, and steamers from that city to and from Europe stop at Montevideo en route, there is a constant trade between the Argentine and Uruguayan cities, and most of the paper dealers and importers in Buenos Aires have their offices, or agents in Montevideo as well, so that many of the remarks in my article regarding the Argentine also apply to this territory.

Our exports of paper to Uruguay during 1926 was $128,211; in 1927, $118,477; and in 1928, $142,092.

While these figures show an increase, our trade represents a very small proportion of the importations of paper and paper products which approximate a million and a half annually, newsprint accounting for about a million and a quarter.

Education

Increased interest is being taken in educational matters in the country, which increases the use of paper. Schools are growing in number, having more than doubled in the past fifteen years, and this fact is having an effect on trade as shown by the increased number of new newspapers, and larger circulation of the older ones. Packing houses also cause a considerable demand for labels, stationery, advertising material, cardboard and paper boxes and other paper products incident to the meat packing industry.

The local manufacture of paper products amounts to approximately a quarter of the importations, so that the annual consumption is about two million dollars in value, or $1.50 per capita.

Kinds Imported

The products which are purchased from abroad—in addition to newsprint, which is the largest item—are white printing paper, cream printing paper, writing, drawing, blotting, cigarette, binder's and ruled papers; envelopes, papeteries, wall paper, sandpaper, strawboard, pulpboard, coated board,

bristol board, blank books, printed books, filter paper, printed music, printed and lithographed matter and colored papers.

Who Supplied Them

Germany has always held a strong position in the Uruguayan trade, owing to the presence there of a large number of German residents and traders. Prior to the war it was the leading exporter of paper products to Uruguay, and while some of this trade was lost during the war period, the Germans are gradually recovering lost ground. Their success has been largely due to the existence of branch offices, and strong representation in Montevideo, and also to the close proximity and easy access with Buenos Aires, which makes it possible for the large German jobbers and printer's supply houses, long established there, to keep in close contact with Uruguayan customers, and supply them quickly from their large stocks.

Prior to the war our exports were principally newsprint in rolls and printed books, but during the war period our trade became larger and more diversified, and owing to the intensive cultivation of the market by American representatives in Montevideo and Buenos Aires, we have been able to retain some of the trade gained during the reconstruction period and even secure additional lines.

How Purchased

In Uruguay, as a general rule, large consumers of paper buy directly from the mills, or paper houses, and usually do not patronize the jobber as in the Argentine. The smaller consumers purchase from stationers or printers who handle paper on a wholesale basis as a side line.

Before the war there was no firm in Montevideo handling paper exclusively, but during recent years, both Americans and Europeans have opened branch offices, or appointed representatives there, and the large Argentino firms have also placed agencies in the city. Some of the largest printers carry considerable stock and supply paper to the smaller printers as needed.

While the large firm with its established office in Montevideo, or Buenos Aires, will probably capture the bulk of the trade from its mere presence on the ground at the psychological moment, there is, in Uruguay, some opportunity for the traveling salesman who can compete with European prices, to secure orders for direct shipment to these large printing firms.

The packing trade serves as an excellent customer for the printers and lithographers of Montevideo, and while the total calls of these people are not nearly as important as those of the Argentine, their needs are increasing; better quality of printing and lithographing is being called for, and as a consequence American manufacturers of printing and lithographing machinery have found it possible to sell in Uruguay, and their machinery has proved so satisfactory that gradually the old plant is being replaced by the more efficient American-made products.

There are between 80 and 100 printing plants in Montevideo, but not more than a quarter of these can be considered of real importance to the American exporter.

There are approximately 225 publications issued regularly in Uruguay; dailies, semi-weeklies, triweeklies, monthly and those issued only occasionally. Most of these are Spanish. Speaking roughly the dailies of the better class have a circulation of about 25,000 each; the less important ones from 8,000 to 10,000. **El Dia**, the most important paper, which has been published since 1885, prints from 6 to 12 pages in each edition, and has a circulation of about 40,000.

Weekly and monthly magazines have never become important in Uruguay, largely due to the proximity of Buenos Aires, and the fact that Argentino publications circulate there.

Duties

The import tariff on paper is somewhat heavy and is of a protective nature. Exporters interested should secure from the Bureau of Foreign & Domestic Commerce the latest information on this subject as rates are changing often. The estimating of duty is complicated, as various charges are tacked on. In addition to the specific duty of a certain sum per kilo of weight, there is a surtax, a charge for customhouse handling, stamp duties, literage, permission to customhouse brokers, commissions, etc.

Kinds of Paper Used

Newsprint is used,—as in many other Latin American countries—not only for newspapers, but also largely as a wrapping paper. Printer paper called for is a combination printing and writing paper, in which white rags and bleached sulphite are the principal ingredients. It has sufficient sizing so that it can be written upon. Machine finished and supercalendered book papers find a market, cheap sulphite bonds for forms, paper with one side coated for lithographic work, etc.

Principal sizes called for are 27½x39½ inches, 28½x36½, and 32x46½, weights from 25 to 70 kilos per ream of 500 sheets. Special attention should be called to the fact that sizes of less than 21¼x34¼ have to pay higher import duties as writing paper.

Amongst the writing papers, the combined writing and printing paper previously mentioned is much used, to which may be added flat writing, sulphite bonds and ledger papers. Cheap sulphite bonds have a large sale, being well suited to both type and hand writing, and the demand for these products is in-

creasing. Size called for is 22.8x36.2, which cuts into letter heads 9x11.4 inches.

For common use this paper is made up in pads of 100 sheets, a printed, ordinary or coated blotting paper forming the cover. Light weight paper is preferred for these pads, and they are ruled by the manufacturers in Uruguay. Our ruled pads are said to be unsatisfactory as they are ruled entirely across the sheet, while the Uruguay trade call for an unruled margin.

Colored papers are little used, and papers without watermark, are preferred.

There is a demand for papeteries, especially those which can sell at from 25c to 50c per box—25 sheets of paper and 25 envelopes. The cheaper papeteries cannot compete with those of local manufacture.

There is, of course, as in all large cities, a certain call for stationery of the highest grade for the wealthy class, and this demand is supplied in Uruguay, largely by British, German and French firms, with a certain amount of American goods.

Wrapping paper, such as we use, is not largely imported owing to excessive duties. Better grades are sold in small quantities, but the market is uncertain and difficult. These papers are locally manufactured and priced slightly lower than imported products so as to secure the trade.

Cheap wrapping paper is made from waste paper, straw, colored rags and some wood pulp, and sacks are made from it for the use of wholesale grocers. Newsprint is also—as previously mentioned—largely used as wrapping paper by the stores, bakers, druggists, confectioners, etc.

Greaseproof parchment and glassine paper is imported, as only an inferior quality is manufactured by the local mills.

Cardboard business is increasing, owing to the fact that many products formerly imported from abroad are now being made in Uruguay, especially in the toilet goods and drug lines, and these call for small boxes, cartons, etc. The packing house industry also calls for cardboard boxes and cartons.

American toilet paper is well established in the Montevideo market, both in rolls and sheets, usually being purchased through commission houses who have representatives in the country. France and Spain have a monopoly of the cigarette paper business. There is little demand for cover paper, and the consumption of blotting paper is not large, the call being for light weight products.

Envelopes such as used in this country are not called for. Those used are of baronial size, of thin coated paper, lithographed or printed inside. Germany has had some success in selling these, but most of them are locally manufactured.

Blank books and letter copying books are locally manufactured, the prohibitive duty being sufficient to prevent importation. About the only product of this kind which comes from abroad is small pocket memorandum books, or of the loose leaf type. America is supplying this demand and the trade is growing.

The wallpaper trade is gradually improving in Uruguay. Most of the new houses are using paper instead of paint or color wash, especially new apartment houses and the better class of residences and offices. While Great Britain has always supplied this trade, American manufacturers may well consider the possibilities of the trade, both in Uruguay and the Argentine. The papers sold come in rolls 9 yards in length and 18 inches wide. Uruguaying walls usually run 4 meters in height, and a roll that will cut into two lengths is the best size. Any American manufacturer who will make an eight meter roll will probably find a satisfactory market in the Argentine and Uruguay. Papers demanded are qualities that retail at from 25c to 50c per roll. Bright flowered effects are popular, especially in the cheaper grade papers, with plain colors in the higher priced goods, to retail at from 25c to 50c per running yard. Borders are used at both top and bottom.

There is very little call for carbon paper, that most sold being purple in color. American sandpaper is sold in Uruguay, commands the highest price and is looked upon as the standard product. Roofing paper is imported in small quantities, but there is no large call as most roofs are flat and covered with tile.

As in the Argentine, the Uruguayan Government is a large purchaser of paper for the Government Printing office—Imprenta Nacional—in Montevideo. The works are divided into two sections, one for the production of miscellaneous job work and government publications, and the other for the government newspaper—Diario Official. About 200 people are employed in the government printing plants and they consume in the neighborhood of $100,000 worth of paper annually. Stock is purchased on contract, after receipt of bids, or sometimes, when there is a shortage they buy on the open market.

There is keen competition for this business, in which the Argentine jobbers and agents take a leading part, the products called for consist of newsprint for official publications, stationery for government offices, drawing paper for the engineering departments, office stationery, blue-print paper, carbon paper, toilet paper, and various other paper products used by the various departments.

Entering the Trade

The paper manufacturer who wishes to enter this trade should endeavor to make connections with export houses who are already in contact with Uruguayan customers, or establish their own agencies in the country to deal directly with the large users. As a general rule it will not be necessary to carry stocks, especially if arrangements can be made with jobbers in the Argentine to supply those products which may be required in quick order.

American firms who have appointed their own men in Montevideo are having success in securing business and contracts, and naturally your own man on the spot is the best method, but he should not be sent until you are certain that you can secure sufficient trade to warrant the cost.

Probably the best way is to combine the representation with that in the Argentine, making periodical visits to Montevideo and Paraguay.

Much of the advice regarding Agencies given in my articles on the Argentine and Brazil are also applicable to Uruguayan trade. Competition with German and British firms is keen, and there is the same necessity for careful investigation of the market before endeavoring to sell. If you are unable to make connections with an American concern, there is the possibility of securing the services of some European firm, or Argentine concern who handles non-competitive lines and will take on your representation.

The Uruguayan trade is well worth careful investigation and cultivation. The total per capita imports in Uruguay amount to $49.50, of which $14.95 come from the United States—this is higher than any other South American country except the Argentine, where the total import per capita is $80.10, with $20.66 from the United States. No other South American country comes near these figures, so in spite of the fact that Uruguay is the smallest republic in South America, the purchasing power is high and our share of the local trade important.

An interesting article on how to measure the Latin-American markets was published in Commerce Reports for February 18, 1929, it contains enlightening information of value to any exporter.

It is, of course, important that exporters of paper and paper products should secure all the latest available statistics, and in order to supply this need, the Bureau of Foreign and Domestic Commerce issues special bulletins, known as "Side runs of the paper trade." Any manufacturer can secure this service by registering with the Paper Division and requesting that they be sent. The bureau makes available within 35 days, the complete quantity and value figures of exports and imports each month, and cumulative figures for the current calendar year with destinations of principal exports. You can get this service from the Department for $1.25 per annum, by remitting to the Bureau or the Superintendent of Documents, Washington, D. C. The publication is known as "Monthly Summary of Foreign Commerce."

The Department also has a list of trade opportunities—definite enquiries from parties interested in importing paper and other products—published in Commerce Reports, $4 per annum.

In my next article I will give you some particulars of the paper trade in one of the nearby Latin American countries.

Permanence and Papermaking

Nos. 7, 8, 9 and 10

By DR. TH. BENTZEN
Chief Chemist, Whiting Plover Paper Co., Stevens Point, Wis.

WHAT is causing the breakdown of the cellulose? From the preceding chapter, No. 6, we have learned that a comparatively higher beater temperature is able to break down the fibrous quality and thereby also the vitality of the sulphite cellulose. But some of the processes to which the rags are exposed on the way from rag room to finishing department will, if carelessly performed, be able to cause considerable harm to the quality of permanence. It is the two processes of boiling of the rags and bleaching of the half stock which claim the full understanding and the utmost attention of the papermaker, and we shall, therefore, make these two processes the subject of special discussion.

The boiling process—The worst enemy of papermaking is speed, and it was the demand of speed which caused the papermaker to make a change for the worse with respect to the boiling process, combining two manipulations of the old way into one, and thereby from the very beginning destroying part of the valuable alpha cellulose.

Formerly, when quality was counted more than quantity, the rags were boiled in cylindrical or globe rotary boilers, and as a rule the boiling was performed only in the presence of lime, after which they were thoroughly washed. If the rags still contained dyestuffs which had not been dissolved and removed through the lime, they were then transferred to a standing cylindrical boiler to be treated with soda ash and again washed.

Nowadays, due to the demand of speed, many paper mills, even fine paper mills, have combined these two boiling manipulations into one, boiling the rags in a globe rotary boiler with a mixture of lime and soda ash. This will result as follows:

$$Ca(OH)_2 + Na_2CO_3 = CaCO_3 + 2NaOH$$

or, in plain papermaker language: Soda ash plus lime changes into the practically insoluble calcium carbonate (limestone) and sodium hydroxide (caustic soda), and in the preceding chapter it was explained that soda hydroxide, only at normal temperature, does not hurt the alpha cellulose, whereas it will at high temperature decompose it into oxycellulose and its intermediate stages, which then passing the dryers on the paper machine will break down further at the sacrifice of permanence.

The bleaching process—We shall first give the active and resulting reactions in chemical formulas:

$$2CaOCl_2 + H_2SO_4 = CaSO_4 + CaCl_2 + 2HOCl$$

and

$$2HOCl = 2HCl + O_2$$

Then, in plain papermaker language: Bleaching powder and sulphuric acid forms plaster of paris (insoluble), calcium chloride and hypochlorous acid,

and hypochlorous acid, which is an unstable matter will decompose into hydrochloric acid, and oxygen, which in the condition of its formation ("in status nascendi") is the "bleacher."

And that is where the trouble comes in, the forming of hydrochloric acid. We cannot prevent this reaction taking place, and thereby prevent the forming of the hydrochloric acid. Everybody is acquainted with the caustic activity of hydrochloric acid, and will easily understand that this matter cannot be permitted to come into the paper. We must remove it from the half stock as soon as the bleaching has been finished, and as we shall learn from the following chapters, we have more than one way to overcome the trouble.

As a matter of fact, not more bleach than is known from experience to be sufficient, should be added to the beater, to prevent what with a misleading term is designated as "overbleaching."

To illustrate this, I shall place before you the results from two experiments, for which I am indebted to a chemist friend:

5 gr. air dry stock from each of two different drainers were prepared as follows: The 5 gr. stock was thoroughly mixed with 300 cc. distilled water containing 0.25 gr. sodium hydroxide (= 5% by weight of the stock) was boiled in an open beaker for one hour.

The one of these two samples where four barrels of bleach had been used for 1,200 lbs. of rag, gave a result of minus 10.74 per cent of the weight of the stock.

The other to which only one barrel of bleach had been used per 1,200 lbs. of rag, only a minus of 3.21 per cent.

That means that in the first of these two experiments nearly 10¾ per cent of the cellulose had been decomposed against about only 3¼ per cent in the second.

That presence of chlorine (hydrochloric acid) in the paper will cause an increase in breakdown of the cellulose, passing over the hot dryers was found through a series of involuntary results in a fine paper mill which permitted me to make use of the reports to illustrate my literary work in this matter.

Mercerization test of paper from wire:	
Alpha cellulose	82.36 per cent
Oxycellulose	14.96 per cent
Glucose	2.68 per cent
Mercerization of same paper after passing dryers:	
Alpha cellulose	73.89 per cent
Oxycellulose	20.11 per ceot
Glucose	6.00 per cent

These tests are averages of six different pairs of samples, all taken within the time of some hours from the same making, and all of them brought to exactly the same conditions with respect to weight, humidity and temperature.

As you perhaps have noticed, I have not yet on any occasion referred to the pH test. In the mill where I have the honor and the pleasure to be employed, we are making use of the pH test in certain parts of the mill control, but where it is necessary to state exact facts, not only with respect to acidity but also to what is present as cause or causes, there is the pH test useless, even misleading. I intend to write an article about the use and misuse of the pH test in the paper mill, and my preparatory work in this matter, as far as it has advanced at the present time, proves to me that the importance, even the fitness, of the pH testing methods for the paper mill is considerably overestimated. I fear I shall have to deprive more than one paper mill chemist of a dear plaything, but to be sure, I shall at the same time replace it through something more useful.

(8) Why is most of the paper made nowadays not as permanent as the paper made fifty and more than fifty years ago?

This question has been answered in the preceding chapters of this series. Set aside that at that time we used only rags, and that we were most careful in the boiling and bleaching—all that can be done, and to a large extent is done, nowadays. It was mainly the washing of the bleached half stock which caused or to a great extent supported the condition, the quality of permanence. As a rule, the bleached half stock was always washed at least twenty-four hours, until a very minute test of the stock proved that even no traces of free acid were any longer present. And this was not at all an exaggerated precaution, because as Girard has later proven, even an amount of 0.006 per cent of free acid will after sometime cause the forming of oxycellulose.

But that was at the time when the papermaker was not comforting his feeling of responsibility, quoting Madame Pompadour "Après nous le déluge." Nowadays the demand is speed, more speed and still more speed, and we cannot afford to have the washers running for twenty-four hours without changing the stock at least four times. That most of the mills have been able to satisfactorily solve the washing problem is due to different mechanical arrangements, which we shall mention later in this article (without violating any secrets), as this is necessary for full understanding.

(9) Why is base paper, used for photographic prints, less inclined to destruction than paper of the same making used otherwise?

It is a well-known fact that paper which has been coated with photographic emulsions (especially the so-called developing emulsions) and then used for photograph pictures, having been treated with a strong solution of sodium thiosulfate, the so-called fixing-bath, possesses a much higher grade of vitality than the original base paper; that is, if the fixing bath (the sodium thiosulfate) has been en-

tirely washed out of the finished pictures. I have repeatedly had opportunity to learn that such pictures had not changed at all after a period of several years, although they had been exposed to all kinds of bad conditions, whereas samples of base paper from the same making, stored under exactly the same or better conditions, had suffered considerably in color and strength—in other words, in vitality. It was the taking advantage of this circumstance that made it possible for some of the German paper mills during war time to produce a base paper from 100 per cent sulphite pulp, which, nevertheless, was possessing a certain degree of quality to meet with reasonable demands of vitality, as much more as the adding of certain organic acids, such, for instance, as citric acid, still more improved the vitality.

The reason for this improvement through sodium thiosulfate is that this compound renders the hydrochloric acid in the paper rather harmless. The chemist will express this as follows:

$2HCl + Na_2S_2O_3 = 2NaCl + SO_2 + S + H_2O.$

or in plain papermaker language: Hydrochloric acid will in combination with sodium thiosulfate form sodium chloride (common kitchen salt), sulphur dioxide (a gas), sulphur and water. Therefore, the sodium thiosulfate is designated as "antichlor."

Of these newly formed matters, the sulphur is dangerous to the wire upon the machine as well as to most dyestuffs and printer inks, and the half stock must therefore be thoroughly washed to as far as possible remove the sulphur. If not, the medicine shall turn out to be as bad or worse than the disease.

Less harmful is the use of ammonia: $4NH + 3Cl = 3NH_4Cl + N.$

or in other words: Ammonia forms with chlorine the soluble ammonium chloride and nitrogen, but ammonia makes the washing room rather uncomfortable as a place to stay in, although I knew a fellow who inhaled ammonia hydroxide with delightful pleasure, as a substitute for "a real drink."

(10) What can we do to reattain this quality, respective condition of permanence, which is characteristic of paper made in the old days?

The plain answer to this question would, of course be: "Make the paper the same way that it was then made," and that would mean "Use rags and wash sufficient," but the irresistible demand for speed and low prices makes it impossible to follow this method now. The answer must, therefore, be modified into "Use as high a percentage of rag as possible, besides a selected grade of sulphite pulp, and arrange your washing system to be as serviceable as possible." And never use more bleaching powder than necessary for preparing your rags.

Some mills try to solve the washing problem by passing water through the drainers, and I suggest that a drum washing system as it is used in the sulphite pulp mills should be taken into consideration. Furthermore, the careful use of an antichlor and following washing may be of help.

But how is one to make sure that the half stock is completely washed out?

I hardly believe that a layman would be able to perform the necessary tests unless he has seen it done repeatedly by an experienced chemist. I shall, therefore, give no detailed information on how to do it, but only mention that the chemist will make use of potassium iodide starch paper to prove the presence of chlorine, and blue litmus paper for acid.

Before I finish this series of articles, I want to mention a matter upon which I have been working for years, unfortunately without any assistance or support—"the evolution of the conifers."

A multitude of volumes has been published in all languages (except in Tennessee) to teach and prove the theories of Lamarck, Darwin, Haeckel, etc., that "man is a degenerated ape," but since Linne presented his classification of plants about two hundred years ago, practically nothing has been done to study the evolution of plants from protoplasm to cotton and conifer. Practically nothing has been looked into, although it is placed before us like an open book.

It must be possible through methods of intercrossing and improving of species, through acclimation and mode of cultivation, to improve the qualities of the cellulose of the conifers to be equal that of cotton and flax. Man is able within a series of generations of these plants to create and to restore what nature has neglected and degenerated through millions of years.

It does not mean much to the papermaker whether his primitive originators were gorillas or chimpanzees, but it means very much to him if we can improve the cellulose of the conifers into the quality of permanence. And this is not a mere question of possibility, it is only a question of scientific knowledge, logic, untiring patience, iron will of man, and last but not least, the support of money, much more than any single paper mill will be able to supply for the use of its chemist. But the Government? Do not be naive. There is nothing in this problem which could serve to enforce the prohibition law, and that means, that the money box in Washington is closed to us forever.

Resumé

Through a very flattering letter signed "a very busy chemist," I have been asked to add a short resumé to these articles, as, although he had the inclination, he had no time to read them over once more. He must be a golf player! But, nevertheless, I shall meet his request, mainly repeating the headings of chapters 2 and 3:

"Rags as paper material is before all the foremost condition for permanence, by no means to be eluded," and

"Grade of rag is the condition of the strength of the paper, but does not influence the permanence."

To this I shall only add: Rag means permanence; sulphide pulp only limited vitality. But careless boiling, bleaching and washing is able to spoil even the very best grade of rag with respect to its qualities of strength and permanence.

And last but not least, I shall warn every real paper mill chemist to listen to all the pseudo-scientific theories about permanence in proportion to pH value, to artificial aging, to ultra-violet light, to red light, to Bengal light on the Fourth of July, to different laundry methods and their influence upon rag, etc., into eternity. Too much chemistry is alchemy, and alchemy has nothing to do with papermaking.

I shall not go so far as to maintain that these theories have not in a certain degree some relationship to paper, because—they are good for the Sunday papers.

The efforts of some plants, completely to replace rag by wood reminds me of the story about the dying wine merchant, who let his son into the secret "It is also possible to make wine out of grapes."

Selling Safety

By WILLIAM E. P. FULLAM

International Paper Company, Livermore Falls, Me.

OLD BILL lowered one hundred and eighty pounds of himself comfortably to a sturdy bench in the smoking room and stretched out the remaining poundage of amply built feet while he methodically loaded his old double action pipe for the mid-day smoke.

In easy vision were four husky youngsters playing cards, as every twenty-four hour cycle found them doing. They represented four different departments of a great manufacturing plant and to Old Bill's eyes they were four potential executives who were daily punching a time clock simply because they themselves needed winding.

There was Jack Thornsen, of Viking build, from the repair crew sitting opposite wiry Doc Dugan from the finishing department. Dealing the cards was Shorty Breton whose ruddy cheeks and black eyes foiled the lanky down-caster across the table, a typical Yankee who answered to the name of Slim Jones.

Old Bill smoked and watched the quartet silently as they passed cards and small talk back and forth until Slim's nasal drawl questioned:

"I say, Doc, how's that pen and ink college of yourn turnin' out? Sold the town hall or Brooklyn bridge to old John D. yet?"

"Well, no," grinned Doc, "the sales haven't got beyond the talking stage yet. But then, boys," as he threw down his hand disgustedly, "how in thunder can a chap expect to get any practice in salesmanship in this town? I'm tied down to my job, and I'm beginning to think that trucking rolls is about the limit of my speed. I've been studying salesmanship for about a year but I've got to get some practice if I ever make good.

Old Bill had listened attentively and now he quietly remarked:

"Why don't you practice right here, son?"

Uproarious laughter greeted this, and Doc's eyes flashed angrily as he answered:

"Isn't it enough for these chaps to ride me every day without your taking a hand? I thought you were a friend of mine."

"I am," countered Bill, "mebbeso a better friend than you figgered. You set there kicking because there ain't nothin' for you to practice on, an' I'm telling you you got the best field you'll ever see right nigh to your hand."

"Oh yes, Bill, no doubt you mean well, but I'm not 'turning my spare time into money by nagging all my friends to buy nick-nacks they don't want. What I'm after is real chance to convince them they ought to buy something worth while."

"And that," said Bill, "is just what I'm talking about. You can't find any better people than these boys you are working with can you? Well then, why in Sam Hill, don't you start in selling them safety? That's something we all need and can't afford to get along without."

Doc smiled tolerantly as he reached for his cards. "Oh, all right Bill, go ahead and kid me if you want to. I thought for a minute you had a real idea under your hat."

The old man leaned forward and punctuated his words with stabs of his pipe stem.

"I'm not joking boys when I say 'sell safety.' It's a job for all of us, but the biggest heft of it has got to be lugged by you youngsters."

"Aw at your age, Bill," broke in Slim, "What we got a safety super for? That job's up to him."

"Sure it is," chimed in Jack, "That guy's got a cinch anyhow. He'd oughter do something to earn his money."

Bill held up his hand for silence. "Now then, you're all talking out o' turn. You listen to me augur for a spell. You, Doc, are studying salesmanship. Now tell me, son, what's the chief idee in good salesmanship? Let's see if you been studying your lessons proper."

"Why the first idea of all salesmanship is to sell the article to yourself."

"Right y'are. Now what do you know about safety, outside the fact that it's just some more rules to be obeyed?"

"Why I've never given it much attention. I guess I'm as careful as the average man anyway."

"I thought so. You figger just like the rest of the bunch, that them safety rules is framed up on the wall to furnish liturature to kill time readin'. Jest something more the company could use for an excuse to ride us fellers with.

"Now them rules is more or less like the Ten Commandments. Most of us figgers that nine of 'em belong to the other feller and the tenth ain't no good. Trouble is we got to have somebody sell 'em to us same's we would an insurance policy, and it's just the same sort of protection only it's cheaper.

"Selling safety ain't like selling potatoes, so many pounds to the bushel, please pay the cashier. You ain't dealing with things you can measure with a yard stick or weigh out on scales. Selling safety is one o' them cases where you got to inject the idee inside a feller and let it work out through his fingers and toes. If the stuff you shoot into him is strong enough it's going to put the know how into his arms and legs so's they'll keep out o' danger. If there ain't no kick to your line o' talk, it's because you ain't sure wether safety's worth selling. Maybe you're one o' them chaps who have to get hurt and look back at what safety might have done for 'em instead of looking ahead at what it could do and so savin' their skin.

"Anyhow, the thing for you to do is to quit looking at them rules as bars to progress and consider 'em as friendly information about how to live longer all in one piece.

"Did you kids ever stop to think that there's folks who rate gold lace at the top o' this company who put in 18 hours a day workin', and what I mean, workin'. 'Tain't all figgerin' out ways and means o' makin' money either. They're puttin' in a lot o' licks at the game o' helpin' us folks out an' making things easier for us. They've covered every pinch with guards, spent a lot o' jack on locker rooms and shower baths and hired doctors and nurses to fix us up and show our wimmin' folks how to look after the young ones proper. They've paid half the bill on insurance for every man jack in the mill and give us a chance to buy preferred stock piecemeal just to show us that they got a real man's size feeling for what a workingman is up against.

"Now these same worked out them safety rules in the same spirit they done all the rest, an' every time I look at them rules I get thinkin' 'if men as busy as they be care enough about us to stop and hold out a helpin' hand, we'd be slappin' the face o' Providence refusin' to take it. The company's really offering to keep our hands and feet just the way they grew and give us a chance to tune up our whole body by this here doctor's examination that every feller can get free. It don't cost a nickel to keep safe but it's liable to cost us a lot if we stay stubborn and get careless.

"It'll take more salesman's talk than ever was writ into a book to keep some o' these hard boiled eggs from takin' chances, but once you get the right idee into your own head you won't need no book to convince a lot o' them of the error o' their ways. Remember, boy, every time you joke about safety, the undertaker starts lookin' over his stock of embalming fluid. He don't believe in gettin' careless and not bein' ready for an accident.

"Now fellers, remember you're every one o' you drawing fair wages from the company. Why do you want to keep on makin' business for the hospital? They ain't payin' you for it and every job they get from here hurts our business, for the only profit from any accident goes to the doctors and undertakers.

"There goes the gong for work. Let's go and knock old man accident so far it'll take a month's wages to send him a post card."

And Old Bill grinned whimsically as he methodically knocked the heel out of his pipe and watched four potential safety executives stride toward the works with purposeful looks in their eyes. He knew that they would punch the clock daily thereafter with a new spirit which would manifest itself in a saving of life and limb in the four departments they represented.

Getting Ahead in the World

WHEN you get right down to brass tacks, it is snap, push, energy. One man succeds and another doesn't largely because of the amount of nervous energy he puts into the job. People by and large are of sound intelligence. Some of us are much more able than our neighbors. Some of us are less able. But you see many and many an instance of a man who is not counted as a brilliant man in any way who has made a great success, simply from that one point, that he has stuck close to his job, worked like the devil and put in all the nervous energy and snap that he had in his make-up. Even if he didn't know as much as the other fellow, his constant devotion to his purpose has brought him success while the brilliant man has failed.

There is no duty we so much underrate as the duty of being happy. By being happy, we sow anonymous benefits upon the world, which remain unknown even to ourselves; or when they are disclosed, surprise nobody so much as the benefactor.—Robt. Louis Stevenson.

Cost Accounting in the Paper Industry

Part XVIII—Estimating Costs of Particular Grades

By D. A. WILCOX

Queries and Answers

In order to encourage discussion on the subject of cost accounting in the paper industry, the author of this series of articles is prepared to answer to the best of his ability any queries on cost accounting that may be directed to him.

CONTINUING our discussion of a mill using actual costs and having no departmental distribution of expense we shall now consider the manner of determining costs of particular grades, which must necessarily be done entirely by estimates, there being no detailed figures that could be used as guides. These estimates would be based on tests and observations, but once established there is no automatic method of checking them except in total by a rather rough comparison between actual and estimated profits each month. This is done by abstracting the sales of each grade for the month and then extending the difference between the sales prices and the estimated costs, thus building up a figure representing the profit which should be secured if the actual costs and the estimated costs are approximately identical. This calculated profit is then compared with the actual profit found in the manner to be described further on, and the two reconciled as well as possible to disclose any gross errors.

The so-called actual profit for the month is found by charging against the month's operations the estimated values of the inventories at the beginning of the month and all charges for labor, supplies, repairs and other expense incurred during the month, and then crediting it with the estimated values of the inventories at the end of the month. The balance left in the account represents the cost of sales which is then deducted from the net sales, leaving the profit or loss as a result. The basis for the valuation of inventories of paper in process and finished paper are the costs as calculated by the estimates.

If the estimates are carefully made and are based on substantial facts there is no reason why such a reconciliation cannot be made with a fair degree of accuracy. At the same time there is no assurance that the estimates are correct unless the cost system is tied in with the general books.

Basis of the Estimates

It is usual in estimated costs to use the paper machines as the focal point, to concentrate all the mill overhead and general expenses there and then apply them to the various grades on the basis of estimated time required on the machines. Subsequent finishing operations are added, either by applying estimated amounts for the labor and materials used or by merely applying arbitrary amounts assumed to cover them. For the purpose of illustration, we shall assume a two-machine mill making specialty book papers and follow through the procedure of developing costs of various grades. All figures quoted are taken at random and are in no way to be assumed as actual costs.

Securing the Hourly Rate

Just as in the case of a standard cost system the first step is to work out a monthly budget and from that an hourly rate, with the difference that in this case it is done only in the case of the paper machines, all general mill expenses being applied there. It will be noted throughout that the figures taken are quite rough and there is a complete absence of hairsplitting. In fact, in the following example, we shall apply a higher degree of refinement than would be the case in an actual application, this being done merely to enable the reader to follow better the various steps. In practical use, for example, if a rate of $25.63 were found, $25.50 or perhaps $26.00 would be used; if a conversion cost of $1.83 per cwt. resulted, $1.85 would probably be used, and so on.

Let us assume that we have worked out our budget for the period of a month and that it looks somewhat like this:

Conversion: labor, supplies, repairs, steam, power, etc.	$30,000.00
Overhead (entire mill): depreciation, insurance and taxes	6,000.00
	$36,000.00
Per day, 25 days a month,	$1,440.00

Our two machines are supposed to have the following normal productions and the expenses will be apportioned between them on the basis of these productions as follows:

No. 1, 30 tons. Expense per day, $785.00; per hour, $35.69
No. 2, 25 tons. Expense per day, $655.00; per hour, 29.77
Allowing 22 hours to a day, then $1,440.00 divided by 55 tons equals $26.18 a ton.

In actual use we would probably call the rates $36.00 and $30.00 an hour for the machines, instead of the exact amounts noted above.

As the expenses are apportioned on the basis of tonnage, the costs per ton on either machine should be the same but owing to the roughness with which the calculations are made this will not be exactly true. Hereafter we shall use the rate of $26.19 a ton for all calculations where the production equals

a ton an hour and scale this up or down as the production varies from this rate. This gives us a figure of about $1.80 per cwt. for such productions.

Basis of Calculating Productions

In the mill under consideratio it should be noted that all figures regarding production are strictly on the basis of finished paper, no other figure being used at any point. Thus when the paper is weighed off the machines, the actual weight of rough paper is immediately scaled down to that of the finished paper expected and the machine productions are reported on this basis, never on the actual weight of rough paper. Each type of finish has its particular estimated shrinkage and this is applied when the paper is first weighed. Thus, if the shrinkage for M.F. sheets is 8 per cent and the scales show 1,000 lb. rough made, it is reported as 920 lb. production. No record is kept of actual rough weights and none of broke or other shrinkage figures. The entire check comes when the order is weighed when shipped out. Thus when we say that our machines have capacities of 30 and 25 tons a day we mean this in terms of finished paper, not rough, and when we say the conversion cost is $1.80 a cwt. we also mean in terms of finished paper.

As finished weights are used throughout and the same basis prevails in the entire system a great deal of confusion in calculations is avoided. Later on we shall discuss the accuracy of such a method and the possible dangers, but for the present we shall confine ourselves to a description of the method itself.

Specifications for Grades

Each grade must have definite specifications made out telling the required productions per hour, the machine speeds and all other essential details. These specifications are based on careful observations and are presumed to represent good normal operations as determined over many runs of the particular grades or similar ones. The following table will show the specifications for two grades which, using a high degree of imagination, we have designated "Grade A" and "Grade B".

	Required production per hour			
Basis weight:	40 lb.	50 lb.	60 lb.	70 lb.
Grade A.				
No. 1 Mach.	2,000 lb.	2,400 lb.	2,700 lb.	3,000 lb.
No. 2 Mach.	1,600 lb.	2,000 lb.	2,250 lb.	2,500 lb.
Grade B.				
No. 1 Mach.			2,250 lb.	2,250 lb.
No. 2 Mach.			2,250 lb.	2,250 lb.

Such productions do not necessarily follow in proportion to basis weights or any other characteristics but are presumed to be those normally secured. Thus, in the case of Grade B, a normally lower deckle for the 70 lb. weight may offset the increase in basis weight. Other factors may similarly affect the productions.

	Required speeds.		Feet per minute.	
	40 lb.	50 lb.	60 lb.	70 lb.
Grade A	300	275	250	225
Grade B			250	250

In the same manner the speeds may be affected by many factors and are by no means in any relation to the basis weights being purely practical matters.

Machine Conversion Costs per Cwt.

We are now ready for the next step, that of converting the specified productions into terms of conversion costs per cwt. of paper. This is purely a matter of dividing the hourly rate (using No. 1 machine as a basis) by the specific production per hour. For convenience in these calculations I have assumed a base rate of $1.80 per cwt. for 2,000 lb. per hour and other productions in proportion. Thus 4,000 lb. per hour would be 0.90 per cwt., and so on.

Following this procedure we secure the following conversion costs:

	Conversion costs per cwt.			
	40 lb.	50 lb.	60 lb.	70 lb.
Grade A	$1.80	$1.50	$1.30	$1.20
Grade B			$1.30	$1.30

Each grade should be studied as to finishing costs. On the assumption that the particular finishing operations which a grade goes through, rather than any special differences in costs as between different grades in any finishing operation, determines the total cost of a grade, we can set up a table for such operations:

Finishing Costs

Calendering	$0.25 per cwt.
Cutting	.12 per cwt.
Trimming	.06 per cwt.
Finishing	.12 per cwt.
Shipping	.10 per cwt.

It is, however, quite possible that we may be conscious of the fact that it does cost more to calender one grade than another, or that a special grade is particularly expensive to finish, etc. If so we should set up a special charge for these grades, but we may feel that all our papers are sufficiently alike to make it unnecessary to indulge in such refinements.

Generally speaking, if the stock costs and the machine conversion costs are plotted with fair accuracy, we get about 80 per cent of the costs. Finishing operations do differ as between grades and as between sizes and weights, sometimes to a considerable extent. In the main, however, it is the different operations which the grade goes through rather than anything else that determines the total finishing costs, so if we get the stock and machine conversion costs correctly and a reasonable amount to cover the particular finishing operations incurred, we shall have our total cost within five to ten per cent. As there are apt to be many exceptions the

safest way, perhaps, would be to make observations on different grades.

Wrapping Materials

We must estimate the requirements for wrapper, twine, cases, frames and skids. Probably a simple division into two or three general groups of grades will be sufficient. Thus we may add to our table the following:

Wrappers and twine, except grades C, F, and K	$0.18 per cwt.
Grade C	.22
Grades F and K	.30
Cases: Size 25 x 38 and under	.30
Over 25 x 38	.25

And so on for skids, frames, rolls and other methods of packing.

Stock Costs

We first estimate the costs per cwt. (air dry) of the various materials used, such costs representing deliveries to our mill.

We next estimate the yields of each material in terms of finished paper. In doing this we may assume certain shrinkages for, say, soda, sulphite, broke and other fibers which are constant for any basis-weight paper made, but we may assume a sliding scale of loss for clay and fillers, increasing from, say, ten per cent for light-weight papers, 40 lb. and under, to 45 per cent for heavy papers of 70 lb. and over. These figures are merely illustrative and are not to be considered as typical. The general idea back of this is that when the furnish first strikes the wire a large proportion of the clay and filler goes right through, but as the mat builds up on the wire it tends to act as a filter, less and less clay escaping, hence the loss is higher in proportion on a light-weight paper than on a heavy one.

Alum and size may be figured on the basis of a flat rate per 1,000 lb. of paper, or varying amounts as may be deemed most expedient. Colors may be similarly handled but in the case of colored papers allowance is usually made for the cost of washing up between runs and the extra cost of the dyes. This will be discussed later on.

Finally we must set up a formula for each grade. This may be on the basis of the quantities or furnish required for 1,000 lb. of paper or on a percentage of the paper made.

Order Cost Form

Assembling all our date for a particular grade we finally get a form somewhat like the accompanying Order Cost Estimate.

As stated before, these are practical costs. Thus it will be noted that only the 50 lb. basis is charged with colors and only the 70 lb. basis with trimming. In these cases it is assumed that the usual practice is to use colors or to trim, but not in the others.

Note that the formulas are based on the amounts required to make 1,000 lb. of finished paper and makes allowance for loss of stock and finishing room broke. No credit is allowed for the latter as the figures are supposed to represent new materials and are therefore net.

ORDER COST ESTIMATE

GRADE: A — Date estimated: May 26, 1930

Materials per 1,000 pounds of paper:

MATERIAL	Price	25x38-40 Lb.	25x38-40 Cost	25x38-50 Lb.	25x38-50 Cost	25x38-60 Lb.	25x38-60 Cost	25x38-70 Lb.	25x38-70 Cost
Sulphite X-L	4.50	200	$9.00	200	$9.00	200	$9.00	100	$4.50
Sulphite M	3.00	310	9.30	310	9.30	310	9.30	330	9.90
Soda pulp	3.75	230	8.62	230	8.62	220	8.25	250	9.00
Broke	3.25	230	7.50	230	7.50	220	7.15	250	8.15
Clay	1.00	250	2.50	250	2.50	250	2.50	250	2.50
Alum and size			1.75		1.75		1.75		1.75
Total stock			38.67		38.67		37.95		35.80
Finishing room broke			12%		12%		14%		16%
Material cost per cwt.:			3.87		3.87		3.80		3.58
Color					.25				
Twine and wrappers			.18		.18		.18		.18
Frames			.25		.25		.25		.25
Cases									
Calendering			.25		.25		.25		.25
Cutting			.12		.12		.12		.12
Finishing			.12		.12		.12		.12
Shipping			.10		.10		.10		.10
Trimming									.06
Conversion over machine			1.80		1.50		1.30		1.20
Cash discount			.20		.20		.18		.16
Cost f.o.b. mill			6.89		6.84		6.30		6.02
Base profit			.45		.45		.40		.40
Base selling price			7.34		7.29		6.70		6.42

Base Selling Price

After determining the f. o. b. mill cost here we have added a base profit and thus determined a base selling price. Thus we recognize at once that we are not in business just to give the paper a ride on the wire but to make some money. We may not be able to get our base selling price but we are more apt to make a try at it if we appreciate right at the start that any sale below our base selling price is distinctly at the loss of a fair profit. If we stop at the mill cost and make what we can we may not make any. This is merely practical psychology.

Special Qualifications

The costs so secured are based on average quantities to a run and size. We must recognize this and make allowance for special conditions. Thus, for example, we might make the following provisions:

Relations of cost on small orders or large orders

Large orders, 50,000 lbs. or more to a size and weight with a good deckle on the machine. Small orders running 10,000 lbs. or less to a size and weight.

The cost of large orders will be less, based on the following:

5% greater stock yields. Average pulp, clay and size costs $80.00 per ton 5%=.....	$4.00 per ton
5% increased tonnage. Average conversion $30.00 per ton=.....	1.80 per ton
	5.80 per ton
So that large orders will cost approximately less per cwt. by.....	.29 per cwt.

Small orders work in exactly the opposite way as follows:

5% decrease in yield.....	4.00 per ton
5% decrease in tonnage. Conversion cost higher by	1.80 per ton
	5.80
Small orders cost more per cwt. by.....	.29 per cwt.

Thus if we should get an order for 50,000 lb. of 40 lb. Grade A, which according to our table costs $6.89, we deduct $0.29, making a net cost of $6.60 per cwt.

Similarly we may make special provision for colors as follows.

5% added to stock cost for additional losses in cleaning up.

10% added to machine conversion cost for the same reason.

Plus the cost of the dye itself.

This completes the structure of an actual cost system of the simplest type, the basic element of cost systems. In the next article we shall discuss this type of system and its various advantages and disadvantages.

Lessons in Steam Plant Practice

Lesson V—Furnace Operation

By J. CHARLES RYDER
Champion Fibre Company, Canton, N. C.

THE Bureau of Mines show there has been very little progress in the past years in working out the various boiler and furnace problems due to the fact that the boiler and furnace were considered together, as one unit. Therefore let us consider them as separate problems, starting with the furnace.

These lessons in Steam Plant Practice are being published in THE PAPER INDUSTRY by arrangement with the Champion Fibre Company, Canton, N. C. They are a part of the general educational course conducted by this company under the direction of J. Norman Spawn, educational director.

Wasting Fuel

There are a number of different ways of wasting fuel for instance if we are careless in handling the coal, fuel will be lost between the bunker and the furnace. Then again if the grates are not adapted to the coal we are burning, or if the fireman is careless, there will be much combustible lost in the ash. The ash should be analyzed frequently, at least weekly, to test for the amount of combustible remaining in it and when this per cent of combustible is found, the B.t.u. loss can be easily figured according to chart shown in Figure 12, prepared by Mr. C. G. Klopp, Combustion Engineer, with the Champion Fibre Company.

For example to find the amount of preventable fuel losses due to combustible in the ash, let us assume that the analysis shows 34 per cent of combustible. The coal analysis shows that it contains 25 per cent of ash when completely burned and that it contains 14,000 B.t.u's per pound of coal. Then starting at the bottom of the chart at the 34 per cent mark we follow the dotted line up to the curve showing 25 per cent of ash in the coal, then across to the line designating the quantity of B.t.u's in a pound of the coal, which in this case is 14,000, then up to the top scale where we can read amount of B.t.u's lost, which in this case is approximately 1,780 B.t.u's lost per pound of coal as fired. This is all preventable when the grates are adapted to the coal and proper firing methods used.

If we have too much grate surface, which is another way of saying, we have too many boilers on the line, the furnace will have difficulty in keeping the grate covered. A thin fire permits excess air to go through the fuel bed, or if the grates are properly covered there will be too much steam generated and the excess steam will go out through the pop valve. This is another unnecessary loss. The correct amount of air for a stoker fired boiler should be 40 per cent excess. There are three reasons for requiring this amount of excess air as follows:

1st—To prevent melting the furnace walls.

2nd—To prevent melting the ash of the coal thereby clinkering the furnace and making furnace cleaning difficult.

3rd—The oxygen in the air entering the furnace through the fuel bed would not be intimately mixed with every particle of carbon and this will make carbon monoxide in the flue gas.

To figure the preventable loss due to more than 40 per cent excess air, see Figure 13 made by Mr. Klopp. Assuming from an analysis of the flue gas (Method of figuring excess air of flue gases will be treated in Lesson No. 7), we have 116 per cent excess air and that the air theoretically required per pound of coal as fired (also to be treated in Lesson No. 7) is 9 pounds and the temperature of the flue gases leaving the boiler is 600 degrees. Starting from the bottom of Chart 13 at the 116 per cent mark and following the dotted line up to where it meets the 9 pound line of air theoretically required, then across horizontally to the 600 degree line of flue gas temperature, then up to the top scale where we read that the preventable loss in B.t.u's per pound of coal as fired due to the excess air is 860 B.t.u's per pound of fuel.

The fireman can do much to maintain efficiency when the grate surface is wrong by use of the draft gauge, Figure 14, to control the drafts. The fires may be right and the drafts wrong, or the fires may

be wrong and the drafts right, or both may be wrong; it all comes back to the fireman.

In Lesson Three, mention was made of good boiler designs and among them was that rapid circulation is a requisite to rapid heat absorption. If the heating surface of a boiler is kept clean and smooth on both sides of the metal, and the passes of the gases so designed and the directing baffles so placed that the maximum surface is covered, and the drafts so arranged that the gases will leave the heating surface at the lowest possible temperature, we shall have done all that it is possible to do with the boiler itself, as an efficient heat absorber. Of course judgment and care must be exercised in the various details of caring for and operating the boiler, such as correct water levels, soot blowing, tight baffles and settings.

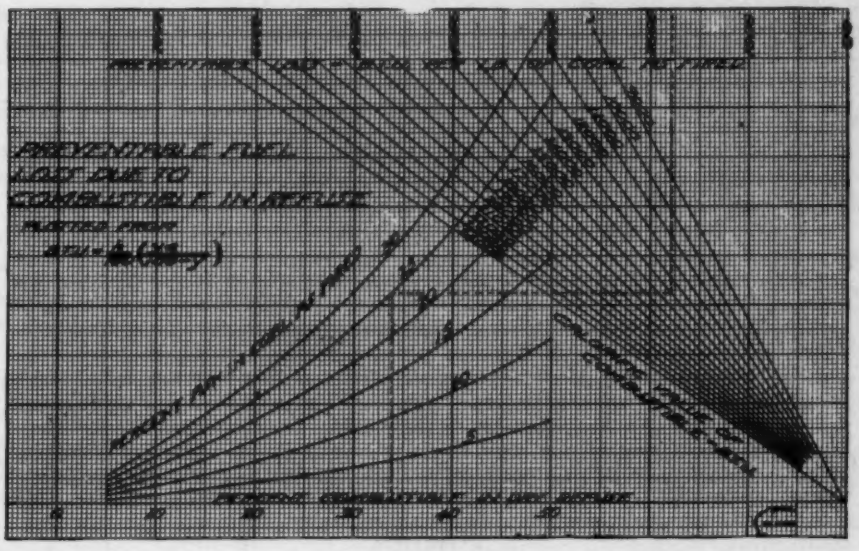

Figure 12

To figure the losses in B.t.u. of excessive flue gas temperature, see Figure 14 (a) by Mr. Klopp. Let us assume, as example, the flue gas temperature leaving the boiler is found to be 765 degrees Fahr., and the steam pressure is 175 pounds, the products of combustion (to be treated in lesson No. 7) is 36 pounds per pound of coal fired. Starting from the bottom of the chart at the 765 degree flue gas temperature, we follow the dotted line up to the 175 pound steam pressure line, then horizontally to the 36 pound line of products of combustion per pound of coal fired, then up to the scale of preventable loss in B.t.u's per pound of coal fired, then up to the scale of preventable fuel loss per pound of coal fired due to excessive flue gas temperature.

When flame which is incandescent matter in the process of combustion meets relatively cold metal, the progress of the chemical reactions, or operation which we call combustion, is retarded if not entirely stopped. This results in smoke and soot and sometimes the release of carbon monoxide gas. The fuel loss may be considerable. The principal loss from soot is an indirect one due to the soot coating the heating surface of the boiler, which retards the rapid transfer of heat, thereby increasing the temperature of the flue gases leaving the boiler. The soot and incomplete combustion losses should be assigned to the furnace, for the reason that if the furnace was wisely designed and operated, the boiler would receive nothing but the products of complete combustion with such diluting air as the necessities of the furnace requires, getting excess air by way of

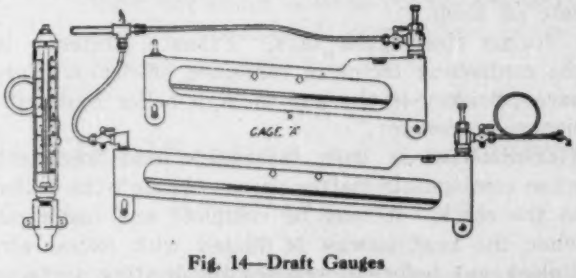

Fig. 14—Draft Gauges

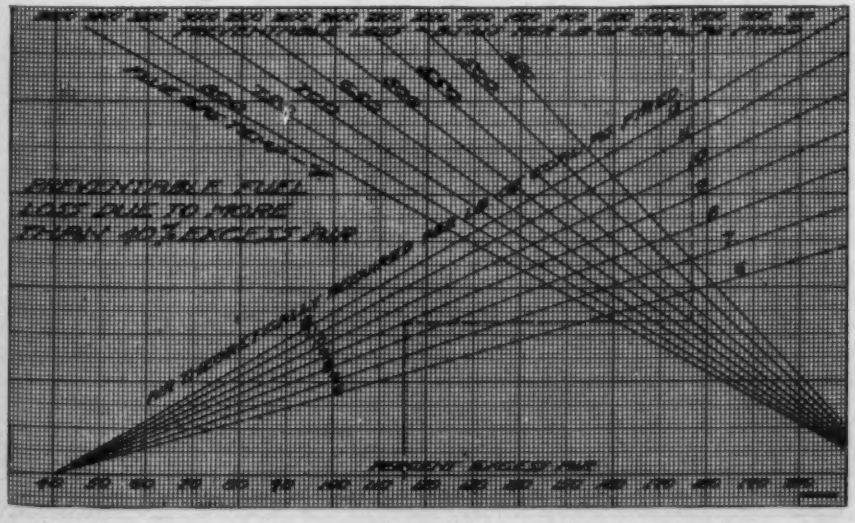

Figure 13

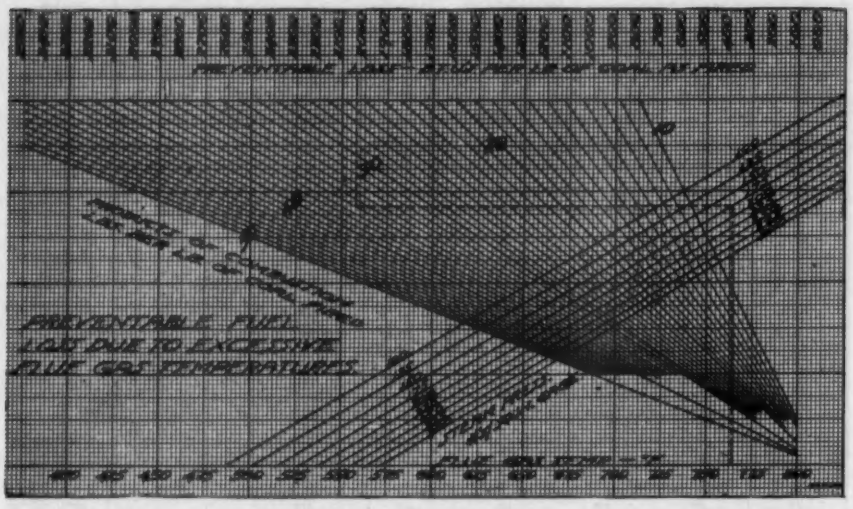

Figure 14a

the forced draft fan only. We will treat this more fully when we arrive at Pulverized Fuel Lesson 11.

Keep the boiler clean, the baffles tight and in place, making sure there are no leaks around the boiler or headers, then boiler efficiency will take care of itself.

Joseph Harrington says, "Furnace efficiency is the controlling factor in combined efficiency. Furnace efficiency is the key to high boiler room efficiency or economy."

Combustion is both incomplete and inefficient when combustible matter passes through the boiler to the stack. It may be complete and inefficient when the heat energy is diluted with excess air, (inleakage) before it reaches the heating surfaces of the boiler. See Figure 15, by Mr. Klopp.

As a problem, let us assume there is 9.4 per cent of carbon dioxide (CO_2) in the flue gas; that there is 3.5 per cent carbon monoxide (CO) gas, and the coal contains 65 per cent carbon. Starting from the bottom of the chart at the 9.4 per cent of CO_2 in the flue gas, we follow the dotted line up to the 3.5 per cent CO in the flue gas, then across to the 65 per cent of carbon of the coal, then up to the scale of preventable loss of B.t.u's per pound of coal as fired, and we find in this case it amounts to 1,800 B.t.u's loss.

Efficiency will be constant if the condition necessary to economical combustion is always present; if the draft, air supply and fuel resistance are kept in their proper relations throughout all variations of load. It is difficult to realize all these conditions under all circumstances, but by careful watching it can be very closely attained. A thin-fire requires a most unremitting attention and a delicate handling of the drafts, if we would maintain furnace efficiency. We cannot reduce the flue gas temperature below that of the water in the boiler; in fact we find it takes about 100 degrees higher than that of the boiler water to hold the steam up and give a good draft, but where there is an economizer we can catch some of this heat to bring up the temperature of the feed water, and reduce the stack gas temperature below that of the temperature of the water in the boiler, because we use induced draft fans to pull the gases through the economizer, but where there is a high stack, natural draft is used, as at (A) in Figure 16.

Let us assume that the water and the steam in the boiler is 325 degrees and that the furnace temperature is 975 degrees, about two-thirds of the delivered heat is available for steam making, and if the furnace temperature is 2,275 degrees, six-sevenths is available for steam making. True boiler efficiency is based on the available heat rather than the delivered heat; in other words, the temperature of the boiler water must be subtracted from the delivered heat to get the available heat.

In the boiler itself we must reckon upon the basis of true boiler efficiency and when we reckon upon

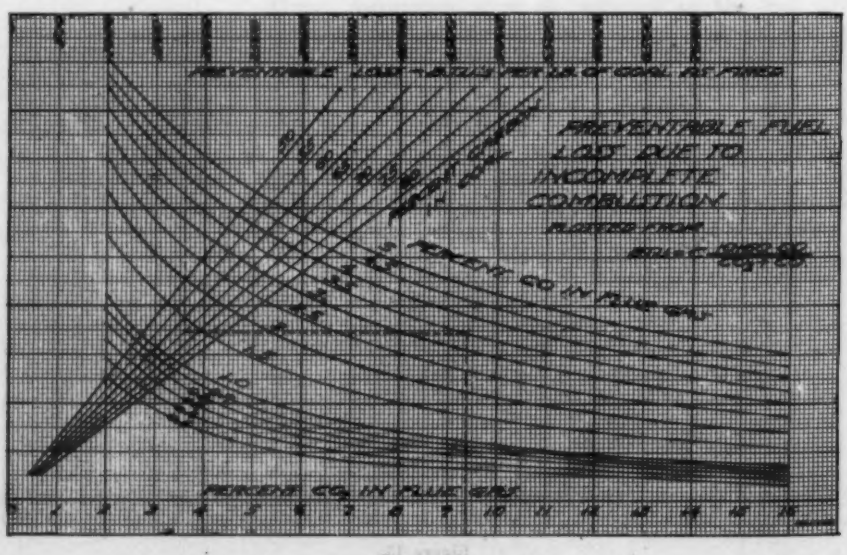

Figure 15

the final effect of the boiler and the furnace as a unit, we call this "Combined efficiency."

Some Historical Facts

At this point the following historical facts should be of interest to the student:

Coal as a commercial fuel was first used in the United States about 1840.

The first to supply coal to a furnace by mechanical means was William Brunton, about 1819. He patented a circular fire grate, revolvable on a vertical spindle, like a disc phonograph record.

John Stanley, in 1822, patented an apparatus for blowing coal into a furnace by means of a fan.

J. C. Bodmer, in 1834, patented the first traveling grate.

John Juckes, in 1841, patented the first endless chain grate.

Samuel Hall, in 1845, introduced the first reciprocating grate bars in connection with a mechanical stoker.

T. and T. Vickers, sometime in the forties, invented the first underfeed stokers. A ram was used to place the fuel in position.

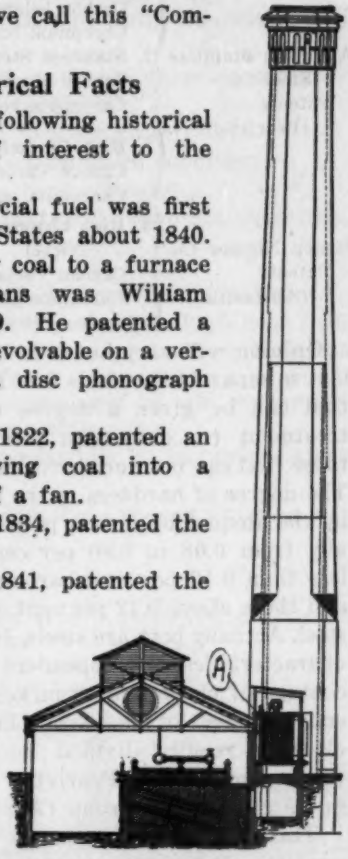

Figure 16

John Bourne, about 1857, seems to be the first to reduce coal to a powder, then blowing it, in a dry state mixed with air, into the furnace.

The Requisites of a Good Furnace

1—The furnace should be so designed and proportioned that the particular fuel it is to burn may be completely consumed with the minimum of air.

2—The furnace should be adapted to the boiler which it is to serve.

3—The construction of the furnace and of its connections with the boiler should be such that the transfer of heat may be as direct as possible from the furnace to boiler, consideration being given for the space necessary for complete combustion.

4—The furnace should be so designed, and such material used in its construction as to insure minimum of repairs.

5—The furnace should be so designed and proportioned as to facilitate the work of stoking and of removing ash and refuse.

6—The furnace should be so insulated as to reduce to the minimum the loss of heat by radiation.

7—The drafts of the furnace should be subjected to proper control by efficient dampers, correctly located.

Steam Plant Practice Questions

(1) What is the most effective way to reduce grate surface?

(2) If the boiler tubes get coated with soot, upon what part of the unit would you place the blame?

(3) Do you think that Mr. Harrington means that boiler efficiencies are higher than furnace efficiences?

(4) State under what circumstances combustion can be complete yet inefficient.

(5) What is the lowest practical temperature the flue gases should enter the breeching?

(6) How can we reclaim excess heat from the flue gases entering the breeching?

(7) Explain the difference between delivered and available heat.

(8) Upon what is true boiler efficiency based?

(9) When was coal first used as a commercial fuel in these United States.

(10) If you should find the flue gases are leaving the boiler at too high temperature and you know the boiler is clean both inside and out, and that the draft is right, where would you look for the trouble?

Classification of Corrosion-Resisting Steels

By H. N. BOOKER
Hermann Manufacturing Company

THE paper industry more than any other, unless it be one of the chemical process industries, should be vitally interested in present day corrosion-resistant steels. Though these steels were made commercially as early as 1916, the art of making them in all forms, learning their many characteristics and variations, and perfecting analyses for specific uses could not be said to have approximated completion until almost a decade later. The last four years can be looked upon as a period of proof of earlier predictions, and it is now safe to say that the few instances of failure of a corrosion-resistant steel, either physically or through lack of such resistance, were due either to not securing competent advice in specifying the proper steel, or faulty fabrication and construction. This assumes that the rigid inspection maintained at all steel mills prevents the sale of any steel which does not meet specifications in every respect.

It is natural to look askance at a material which is so fundamentally new, but it must be remembered that startling and so-called "impossible" things are being done. The "I'm from Missouri" attitude must

go hand in hand with an open mind and some reliable fundamental knowledge, if the uses of the corrosion-resisting materials are to be economically and satisfactorily developed in each mill and the maximum benefit derived from their development.

Millions of dollars have been expended by the mills in research work and in the facilities for the manufacture and distribution of corrosion-resistant steels. That this expenditure was justified, and that worthwhile savings have been passed on to the consuming public, is evidenced by the fact that the departments in the mills producing these materials are being taxed to their capacity while the demand continues to multiply.

The word "savings" has been applied to so many economies, real or fancied, that, like "efficiency," "service," and many others, its use is becoming obnoxious. Nevertheless, until a new word with the same meaning is coined, we must continue to overwork it. In the use of corrosion-resistant steels, the savings are real only when the material is correctly applied. A general understanding of the various classes is not difficult to acquire and grows with use. Indications are that such an understanding will, comparatively soon, become general. For the present, however, a working knowledge provides the paper manufacturer with another of the all too few agencies for reducing expense and increasing the margin (if any) between cost and selling price.

Several excellent treatises on "stainless" steels have been published, but the average man, whose interests are primarily "Paper," has found it difficult to tie in this information with the specific description given by the individual steel producers. This is readily understandable. For instance, from information at hand in answer to our inquiries to two different mills, and from additional data furnished by the various mill representatives who call upon us, we can count more than eighty different trade names under which corrosion-resistant steels are sold, and a search for the maximum number would probably double this figure. To aid in the transition from the general technical information to the everyday problem of purchasing and applying the right trade name or specific product, it is helpful to classify them.

Corrosion-resistant steels can readily be arranged into four well defined groups of radically different characteristics and the members of each group will have progressively similar analyses and uses. This allows us to learn the characteristics and distinguishing properties of four groups and regardless of whether the combined producers furnish us these steels under eighty or two hundred and eighty trade names, we have a fundamental knowledge which permits their intelligent application. Though all are generally called stainless steel, the four classes may be differentiated as follows: Stainless Iron, Stainless Steel, High Chromium, and High Chromium plus Nickel.

American Stainless Steel Co. Patents (Pearlytic)	1. Stainless Iron Carbon below 0.12% Chromium below 16%	Respond to hardening and tempering the same as ordinary steel
	2. Stainless Steel Carbon above 0.12% Chromium below 16%	
	3. High Chromium Carbon Variable Chromium above 16%	
Krupp Nirosta Co. Patents (Austenitic)	4. High Chromium plus Nickel Carbon Variable Chromium plus Nickel above 16%	Can not be hardened by heat treatment

Opinion will vary but it is believed most convenient to separate the steels first into two classes, those that can be given a degree of hardness by heat treatment (or chromium below 16 per cent) and those that can not (or chromium above 16 per cent). The degree of hardness in the first class is governed by the amount of carbon present. This ranges usually from 0.08 to 0.80 per cent with those having less than 0.12 per cent carbon called stainless iron and those above 0.12 per cent carbon called stainless steel. Actually both are steels. In the second class, the characteristics are dependent largely on the percentage of chromium or nickel and chromium present, the effect of the carbon being secondary. This class is readily divided into the straight High Chromium Group (Pearlytic) and the High Chromium plus Nickel Group (Austenitic).

This grouping covers the present commercial practice. It must be remembered that in some cases an analysis will come on the border line in which case its properties will correspond to its position. There are often other elements added to secure some special characteristics such as zirconium sulfide for machineability, copper for added corrosion resistance to salt water, silicon for additional resistance to scaling at high temperatures, molybdenum which assists in keeping carbon in solution and aids machineability, etc., but these need not interfere with the classification, for in cases when they are used, the additional property is added to the group characteristics.

Corrosion-resistant steels are as a rule about 10 per cent lighter than bronze. They should never be heated in a forge fire. Following are a few of the properties of each group which will serve further to illustrate their groupings:

Stainless Iron:

Corrosion-resistant without heat treatment.
Can be hardened only moderately at high limit of carbon.
Heat treatment gives maximum corrosion resistance.
Difficult to weld—riveting preferred.
Machines readily in annealed condition.
Can be forged easily.
High tensile strength.

Stainless Steel:

Not corrosion resistant until hardened and polished.
Can be hardened much the same as ordinary high carbon tool steels.
Difficult to weld; riveting preferred.
Machines readily in annealed condition.
Can be forged without difficulty
Still higher tensile strength than Stainless Iron.

High Chromium:

Corrosion-resistant without heat treatment.
More resistant to corrosion and high heat than either of the Stainless Iron or Stainless Steel Groups.
Can not be hardened except by cold working.
Is not so strong as stainless iron.
Can be welded successfully by an oxy-acetylene torch.
Very malleable—suitable for deep drawing and forming.

High Chromium Plus Nickel:

Most resistant to severe corrosion conditions and high heat.
Can not be hardened by any heat treatment.
Can be welded either by oxy-acetylene or electric arc.
Must be heat treated before it can be machined.
More difficult to machine than Stainless Iron, Stainless Steel or High Chromium Groups.
Work hardens very readily.
Difficult to forge.
Very good for deep drawing and forming.

Much could be written concerning the properties and application of these steels, but it is not expected that all of us become metallurgists in order to benefit by their advantages. However, if the various products presented for your consideration are classified with the above outline and their properties checked therewith, the numerous trade names will not be so confusing, and you will be in a position to quickly and correctly decide as to their proper application.

The best preparation for good work tomorrow is to do good work to-day; the best preparation for life in the hereafter is to live now.—Elbert Hubbard.

View of an Old Paper Mill in Scotch Plains, New Jersey

OUT on the road between Scotch Plains and New Providence in the State of New Jersey stands an old paper mill that was built and operated many years ago by Edmund Seeley. Mr. Seeley came originally from Troy and operated the mill for 60 years until his death in 1913. The mill then changed hands and was eventually allowed to stand idle. The splendid waterpower available at the mill site is now going to waste and two tall stacks rise in the air as a reminder of the time when the place was a scene of the greatest activity, for in addition to the paperboard and specialty papers manufactured, pulp was also produced, three to five carloads being shipped daily.

Current Thought by William Sibley

Hard Times Are Fearful Times

BUSINESS is "bad" in this country,—but to no such extent as current pessimism would indicate.

There is only one reason why we should be "enjoying" a period of depression at this time. That reason is Fear. Fear has made the first half of 1930 a difficult period for business, and it is fear that has exaggerated our difficulties all out of proportion to their reality.

Fear is an imperious thing. Fear grows by holding back. It has big eyes, blue glasses, false ears, and feeds on the quivering flesh it causes to quiver. Fear causes doubt, over-caution and hesitation to clog the wheels of both thought and progress; making all of us acquiesce to the beliefs and prejudices of our associates, and to doubt our own ability to meet emergencies.

Fear so blinds us to true conditions that, at least during the past six months, we have failed utterly to see that while pay-rolls are perhaps 15 per cent below normal, dividend and interest payments have averaged 15 per cent higher than the same period of 1929. We fail to see that the pipe industry is unusually prosperous; that printing and publishing has in many instances exceeded all records; that exports of industrial machinery and agricultural implements for the first half of '30 are far ahead of the first half of '29; that air transportation has forged ahead to a record breaking peak in spite of our depression; that retail sales are less than 6 per cent off last year; that inventories are exceedingly low and that soon we must begin replenishing our national larder; that pee-wee golf courses are doing a land office business in every part of America; that last February when both business and weather were bleakest, Florida enjoyed an influx of automobile tourists and winter vacationists that broke all previous February records; that while people were not buying automobiles, they were buying gasoline in a volume never before experienced in any similar period.

Hard times are only fearful times. Times full of fear make times which are hard—for no reason other than the existence of fear. And the exercise of fear and pessimism today is proving just as costly (and just as foolish) as the exercise of optimism and over-confidence a year ago. No one has ever been able to disprove the merit of the principle that the time to buy is when business is bad. To be overcautious and hesitant today means to pass up opportunities which may not be repeated for another fifteen years.

In spite of the fact that Chicago has grown to a healthy three and one-half million and has an industrial movement quickened proportionately, fear has caused real estate values to slump to a level approximating the sheriff's door-step. Banks will not loan a slender dime on "unimproved" property in Chicago and will invariably give a good impersonation of a balky mule when asked for a loan on even the best improved property. All of which is done with the idea of preventing an accumulation of frozen assets, but all of which is very silly. And all of which caused me personally to invest heavily (for me) in Chicago real estate—getting thereby an amount of property which is at least 30 per cent more than could have been purchased for the same money eighteen months ago.

One man—a bond salesman—didn't believe the current rumor that people wouldn't spend money for securities. Not being able to make his personal conviction stick amongst his metropolitan friends, he packed his grip and went to the smaller towns. At the end of the first day this salesman wired an order to his house for $250,000 worth of bonds—thereby making his employers doubt his sanity. But, strange to say, his order proved bona-fide, and his sale was put down as being just one of those "miracles" which happen once in a lifetime. Unfortunately for his employer's judgment of the salesman's ability and foresight, the next day came an order for $75,000 worth of bonds; the following day $125,000; the fourth day $30,000; and so on—he missing only one day in seven weeks in making a sizeable sale.

Another man—the President of the Radio Corporation of America—is another who has failed to become inoculated with the Fear germ. During the last week of July he hired 7,000 more employees and has increased his plant capacity to a point where it has never been before. This man is backing his conviction that present times are not so hard as some

would have us believe with a greatly strengthened pay-roll and increased production.

It is my personal belief that we are right now scraping the bottom of the depression jar. That is to say—Fear has run its course and reached the point where repeated pessimism no longer carries weight. The gloomy news of yesterday has lost its force. Little by little, Fear is being replaced by confidence, and our Fearful Times, alias Hard Times, are about over.

And why shouldn't it be—? Bank credits have expanded to a point where they are now about 1 or 1¼ per cent above normal, and this means that so long as this expansion continues, either price levels or the volume of business activity **must** rise—or both.

There is more idle money in the country than is good for its owners, and this idle money is now beginning to seek a job. Something over 3,000 millions have been withdrawn from the securities market during the past year, and because much of this capital is not now working, the cost of this idleness is probably more costly than the current unemployment of labor. This money is gradually being released for active service, as evidenced by the recently stimulated buying by estates and trust companies.

Inventories are exceedingly low at the present time, both wholesale and retail. This depletion of the national larder cannot long continue or a serious shortage of consumer's goods will result—and this will never happen.

The agrarian situation is still perplexing, due to what is commonly termed "overproduction" but which in reality is inefficiency on the part of the farmer. The country as a whole has yet to realize that the United States is entering upon an era of transition which is swinging it from an agricultural nation to an industrial commonwealth. Heretofore such transitions, which have been experienced by other countries, have reduced the farmer to a peasant. In this country, the transition is having the opposite effect. It is changing the farmer to a business man—but any sort of change, good or bad, is inclined to hurt. Sometime—somewhen—this nation will have one-sixth less farmers than we have today. Farmers will be consolidated and "corporation farming" will be the order of the day.

This is an inevitable change, since every time the Harvester Company ships a tractor, that tractor releases one or two men and six or eight horses for other work. Farming is becoming mechanized. It is rapidly becoming a **business**, as we know the word. But the transition, which must eliminate upwards of five million farmers, will create squawks and howls which will put our republican form of government to a severe test. That we will live through it is assured. In the meantime we will lose presidential elections and go through a period of chaos which will probably do more for the headache powder manufacturers than any other single thing. But so-called farm "relief" will come only through the elimination of the inefficient. And this means that we might as well settle ourselves to the expectation of an "agricultural problem" as long lived as that of the Irish question.

The building situation is improving in many centers. For 24 months the building trades have been "off color" from the prosperity standpoint. Today the demand for small homes and modest apartment dwellings is showing a decided increase. We may expect increased building trades activities during the ensuing six months.

Automobile production, one of the major keys to the steel industry, is now on the up-grade. Manufacturers during the past two months—and others during the next two months—will bring out new models (at lower prices) and this will act as a much needed stimulant to automobile manufacture.

There is little or nothing to the notion that the next few years will bring only a dearth of opportunities. It has been pointed out during the past few months that the present depression will last "for sometime to come." This, in the opinion of many, is sheer bunk. How about the development of Alaska—with its resources, the extent of which we can only faintly grasp?

What will be the effects on life and business of the expansion of the cellulose industry; the utilization of rocky farms to produce crops of poplar trees that will show 45 years' growth in 8; the extension of gas pipe lines to every part of our country; the cheap production of wrought iron, as promised by the Aston process; the widening use of dry ice, quick freezing and modern refrigeration; the elimination of most of the dangers encountered in flying; the development of ice engineering; the commercial introduction of television; and the every-day use of electric bulbs producing artificial sunlight filled with vital rays for the illumination of homes?

The next 10 years wil probably bring us more radical changes than did any other decade in all history. A far-flung army of hundreds of thousands of workers will be engaged in all the diverse fields of electronic application. New billion-dollar industries will be built upon the vacuum tube, especially in the power field. The so-called electric eye will be applied to hundreds of new uses. Nothing the average man sees, hears or buys but will be controlled, regulated or affected in some important respect by an electronic tube, or photo-electric cell.

Is there any reason why we should change our opinion concerning the far-reaching developments in the fields of chemistry, road building, aviation, transportation, farm electrification, pipe line transportation, or marketing? The manufacture of artificial weather for our buildings and homes, the re-design of our towns and cities to meet the requirements of an advanced age, the reduction of crime, the modernization of educational methods, and countless other jobs remain to be done—all of which will get their start during the next ten years.

Where is the logic in the insistence that one sell America short?

The Origin of Papermaking

With References from Dard Hunter's Latest Book, "Papermaking Through Eighteen Centuries

By GEORGE FRENCH

CHINA is made responsible for the origin of many of those things which, upon being subject to the searchlight of modern methods of investigation, appear to fade away in the mists of historic regions beyond the ken of researchers. If a custom, a social habit, a method of science, the beginnings of phases of learning, the first manifestations of art or craft (such as printing, pottery, textiles, silk making, and many other things) eludes the wiles of the investigator of this day and generation, it is found convenient to refer to that period in the history of China which antedates definite knowledge.

It is thus with paper. It is not known, definitely, when and where it first was made. Traces of it have been found back two or three centuries before the Christian Era, according to some not too reliable writers, but lacking physical evidence such as implements dating that far back or specimens of paper with a more or less reliable record. There is nothing to show that the Chinese did not form sheets of paper long before the date, 123 B. C., which has been fixed by the optimistic persons alluded to. China was by then an ancient country, and within it there had been developed many arts far more complicated than papermaking as it first was practiced. It would seem that the necessity of recording events and making treatises on religion, science, and other things, may have driven the Chinese to have made paper, or its equivalent, a long time before the date specified.

Few Early Works on Papermaking

But Mr. Dard Hunter, the author of "Papermaking Through Eighteen Centuries," a most interesting book made and published by William Edwin Rudge, New York, spent much of his time during twenty-five years researching the matter of the early history of papermaking, and he apparently favors a date of about 105 A. D. as approximately the beginning of papermaking in China. He does not actually accept that date, merely remarking that "some historians state emphatically" that the craft began in that year. As to the writers who made mention of papermaking in its earliest days, they are few who lived and wrote before the late years of the fourteenth century. Mr. Hunter says that in his systematic search for books or manuscripts relating to the early days of papermaking he found but about thirty volumes, and that by 1915 he had found but 167 items that related to watermarks of handmade papers, and had since discovered about half as many more. It was the use of watermarks that seemed to attract the attention of writers rather than the making of the paper itself, which was what Mr. Hunter sought to trace. "The greatest and most prized of all works relating to this subject is a manuscript by Ulman Stromer in the German National Museum at Nürnberg." Only a photographic facsimile of this document is available. And at that the document does not tell much about papermaking. It relates the difficulties Stromer experienced in establishing his paper mill outside the western wall of Nürnberg and the trouble he had with his workmen. Stromer undertook to keep his processes of manufacture secret, and he required all of his workmen to take an oath of fealty to him and that they would not reveal any of the methods of papermaking they might learn while in his employ. These workmen he was compelled to import from Lombardy, where papermaking had been going on prior to Stromer interesting himself in it. Himself, he knew nothing about the craft save what he had observed while traveling in Italy, as a merchant. He had much trouble with his workmen. They thought that if he was so particular as to swear them to secrecy there must be opportunity for them to set up for themselves, or for them to obtain control of Stromer's business; so they interfered with the operation of the mill, "did as they pleased and caused me many difficulties, not suffering the third wheel to run at all."

This first important document, therefore, threw little light upon the processes of papermaking, as will be seen. Nor did any other of the writings of those early scriveners mentioned in the book. They alluded to some phase of papermaking, or perhaps only indicated that there was such a craft coming into existence. Hans Sachs, for example, a cobbler of Nürnberg, was the first writer to compile a poem about papermaking. The poem consisted of a verse printed under an engraving by Jost Amman showing a workman dipping a paper mould into a vat of pulp, and the poem was:

Rags are brought unto my mill
Where much water turns the wheel,
They are cut and torn and shredded,
To the pulp is water added;
Then the sheets 'twixt felts must lie
While I wring them in my press.
Lastly, hang them up to dry
Snow-white in glossy loveliness.

Not very vital stuff relative to early papermaking, though it was turned out in 1568.

Still, something in the way of developing uses for paper was coming to the front occasionally. For example, Samuel Zimmerman, in 1579, issued a book on technical papermaking suggesting the use of paper for bookbinding and other bibliographical purposes, but in other respects it was not "of any great importance regarding sixteenth century papermaking." It is a lamentable fact that there is not much literature on papermaking that is of importance prior to the early development of printing following the invention of movable printing types by Gutenberg. There seemed to be in the minds of the early makers and users of paper little of the importance it would later attain in the development of civilization. Mr. Hunter extracts from Shakespeare an amusing bit that may mirror the thought of his time relative to paper and its uses. In **King Henry VI**, Jack Cade is made to say to Lord Say: "Thou hast most traitorously corrupted the youth of the realm in erecting a grammar-school; and whereas, before, our forefathers had no other books but the score and the tally, thou hast caused printing to be used; and, contrary to the king, his crown, and dignity, thou hast built a paper-mill." Papermaking was not in high repute, according to what may be extracted from the writings of those ancient authors who condescended to mention it at all; with one conspicuous exception, one René Antoine Ferchault de Réaumur, a physicist who was not so much interested in papermaking as in the study of insects. He planned a great work, of twelve volumes, called **Memoires pour servir a l'histoire des insectes.** He died after publishing six volumes of the work, but in one of the volumes he suggests the use of wood for papermaking. He was led to do so through a study of wasps and their nests, which he found to so much resemble paper that he made comparisons and gave the matter enough attention to cause him to make experiments, and finally to expound his theory in these words:

"The American wasps form very fine paper, like ours; they extract the fibers of common wood of the countries where they live. They teach us that paper can be made from the fibers of plants without the use of rags and linen, and seem to invite us to try whether we cannot make fine and good paper from the use of certain woods. If we had woods similar to those used by the American wasps for their paper, we could make the whitest paper, for this material is very white. By a further beating and breaking of the fibers which the wasps make and using the thin paste which comes from them, a

very fine paper may be composed. This study should not be neglected, for it is, I dare say, important. The rags from which we make our paper are not an economical material and every papermaker knows that this substance is becoming rare. While the consumption of paper increases every day, the production of linen remains about the same. . . . But all of the wasps of the kindgdom that I know make nothing as singular as a species of wasp that lives in Canada. . . . At first glance, and even after examining the surface for a considerable time, one would accept the nest as the work of the hand of man. Its covering resembles our paper to such an extent that it is hard to detect a difference. It has the same gloss and the color is that of an old piece of manufactured paper which had formerly been white. It is fine paper and as heavy as that of ordinary portfolios."

In the light of the patent fact that wood pulp either forms the whole substance of almost all modern papers, or is used as the basis of a class of papers known as of rag content, it is interesting to note that this French scientist may have been the first seriously to suggest that wood fibers might be used in papermaking. But for him, or some other illuminated mind, we of today would be hard to put to it for a basic material for paper. Yet it must be considered that wood would inevitably have found its place in papermaking. It was one of those discoveries that had to be made, like printing with movable types. The world could not have continued to wag without printing, and printing could not have developed without paper, and paper never could have served its office to civilization without wood. M. Réaumur in noting the character of the nests of his wasps was an involuntary commissioner of progress to the world, it would seem.

In an attempt to follow Mr. Hunter in his research for the beginnings of paper-making it is necessary to close one's eyes to much interesting matter, and break the continuity of his work. Which is a pity, since he expended so many years in the attempt to make a story that would read smoothly along the centuries and give a view of the evolution of a material which has done more than any other substance to promote material and social growth in the world. I have indicated that this objective was not very well served by the early writers who mentioned paper in their works. The pitiful fact is that they merely mentioned paper as existing but did not realize their responsibilities fully enough to tell what paper was in the remote periods in which they lived and wrote.

Old Appliances and Methods

Turning, however, to the chapter in Hunter's book dealing with "The appliances and methods of Oriental and Occidental Papermakers during the Development of the Craft," we come upon something more concrete, important, and interesting. The author takes us back nearly two thousand years, to A. D. 105 in fact, and begins to pick up his clues from physical appliances which lead us from China westward to Samarkand, to Bagdad, to Damascus, to Morocco, to Xativa, Spain, to France, to Germany, to Italy, and, after a long interim, to England. It was in 1494 that John Tate first made paper in England. It was not made in Holland until 200 years later, and Holland became famed for its handmade paper. It was a stretch of twelve and a-half centuries between the first, probable, making of paper in China to the first production of it in England; and in all that time paper had become little other than the first sheets turned out by the Chinese. It had been improved in many smaller particulars, and many other materials had been made to form its substance, but the implements used to fabricate it were essentially the same, and the processes of manufacture did not materially differ. Tate built a mill, but within his mill his men made paper about as the Chinese made it in the open beside the small streams of the country. This did not result altogether because of the lack of initiative on the part of all those who had made paper during these twelve centuries, but because those primitive Chinese operated upon basic principles and devised fundamental appliances and methods.

Hunter searched for old molds, or scraps of molds, and other remains of appliances, or primitive mills, and found all too few of them. He had to stretch his imagination across the misty expanse of two thousand years, and he found but few relics of the men who had been making paper all that time. They did not know that they should have carefully preserved sheets of their products, kept accurate records of their finances, kept diaries in little bound volumes, etc., for the benefit and delectation of those who in after centuries would try to follow their trails and discover what sort of men they were and what they did in the way of papermaking. The carelessness, or obtuseness, of our ancestral races was abysmal and inexcusable! But Hunter merely remarks that "The methods that were used in the making of paper during the early centuries of the craft are naturally vague after the lapse of almost two thousand years." He found no records indicative of how the Chinese made paper, but he is convinced that "as with the ancient arts of the weaver and the potter, the method of hand fabrication in this craft must have changed but little from its inception to the present day." He rehearses that sheets of paper were then made from disintegrated fiber and upon flat molds, and that it is in this fashion paper is still formed, the only differences being in the treatment of the fiber and the construction of the molds. The fundamental principles applied then and now remain the same.

This forces a slight digression: On the first page of the first chapter in this book, Dard Hunter indicates how he became interested in the subject of handmade paper by remarking that it would be difficult to do so; but he goes on to indicate how he became infatuated with the matter, and why finally he gave himself so completely to unraveling its historic skein. But he never has been inquisitive about the making of paper commercially on the huge machines of today, except to note that the implementing of the process does not basicly differ from the Chinese process of twenty centuries ago. "The improved paper machine," he remarks, "is essential to cope with modern life as it has come to be, but I would be content never to see again one of those long, ponderous, steaming, dragon-like, machines, emitting from its jaws the streams of paper that are thought necessary to our very existence. Inasmuch as I am a user, indirectly, of several hundred tons of rolled paper a year, I trust my good friends, the papermakers, will not censure me too severely for speaking so frankly and unkindly regarding the modern version of the invention of Mr. Nicolas-Louis Robert." An yet, while laboriously showing the multiple connections of the very ancient and the very recent methods of papermaking, and causing us, his readers, always to realize the sameness of the great scheme of civilization, he takes pains to let us know that he himself does not have that vital realization, and does not consciously recognize that modern methods and modern machinery have been the mediums through which paper has become the vitalizing element for the development of civilization. He lapses into that historic coma which is the resort of many men when they find their consciousness swamped by the bigness of theories that began to fascinate them because of their novelty, and is found contemplating his thesis through the small end of the mental telescope. This, and physical bounds, induces him to limit his observations from their vague beginnings to the end of the eighteenth century. Yet everything in the book leads the reader to think about the papermaking developments of the twentieth century. Hunter places himself in an isolated position, and minimizes his stature.

The papermakers of China probably at first poured the pulp into box-like molds, instead of dipping the molds into the pulp, a slow process, limiting the quantity of paper that could be made in a day to a small number of sheets. Then, sometime after this slow beginning, but at a date not now possible to determine, they began to dip the pulp up into the molds. The old method still persists in certain of the Shan states of Burma; though the methods of macerating the pulp and forming the sheets is not exactly like the original Chinese methods, but not much improvement upon them. Hunter explains this Shan process in detail. Since there are no Oriental books dealing with the fabrication of paper it is not possible to rediscover papermaking methods of the East in ancient times. The earliest technical Japanese treatise on papermaking is "Kamisuki Chohoki," by Kunihigashi Iibei, who made the first paper in his province. The methods he described had been in use in Japan and China

for probably centuries. The methods were all identical in principle, but in different countries, and in different provinces of the same countries, the equipment and manner of working was not the same. This book describes the manner of forming the sheets as that of dipping. It is likely that the pouring method never was practiced in Japan, doubtless having been discarded in China before Japan began to make paper. The Japanese paper was made from pulp obtained from the paper mulberry, called in Japan makaso, or takaso. The heavier sheets were made by men and was called "sugihara," while the lighter sheets were made by women and were called "hanshi."

Probably the making of handmade paper persists to this day in Japan more as it originally was developed and to a greater extent than in any other country where it once was a leading and important industry. A great deal of Japanese handmade is imported into New York City and consumed there, though plentifully distributed to other cities and other countries. There is one concern there that assiduously canvases Japan and buys all good handmade it can collect. The vice-president of this house is also the buyer of Japan paper. Early in his career as such he discovered that he must become inured to many Japanese habits if he hoped to get in touch with the individual papermaking concerns, which were families who made a few bundles of paper each during the year; so he became an eater of raw fish, for one thing! He spends about one-third of each year going about in Japan, buying and paying for on the spot the little lots of paper. Each lot has its individual characteristics, though gradually he is persuading the Japanese papermakers to in some measure standardize their product, to make it more marketable and to secure continuance in quality, weight, sizes, etc.

Like methods as those in the Orient were employed in Spain up to and during the twelfth century. During the next four centuries there was little progress made in papermaking, so far as can be inferred from documents and the remains of appliances recovered by Mr. Hunter, or other evidences of methods employed. Before the invention of movable types for printing there was little use for paper in Europe, and it was not until Gutenberg came upon the scene that papermaking got its real impetus; and then its history began to take permanent form, though even then there was not much pains taken by any historian to make accurate records of its development. There were, however, many pamphlets, and some books issued that dealt with the matter of papermaking more or less fully. They were more concerned with it as a new and novel industry than with the scientific features. These books were many of them illustrated with good engravings showing the processes of papermaking. From this point this book finds easier going. There is a mass of material at hand. Some of it is crude, and little of it is wholly satisfactory as history sources. Less has to be inferred, and there are fewer vacuums. "The precise methods used by papermakers in the days of Gutenberg, Jenson, and Caxton, are no more clear to us than are the exact processes employed by the early printers in their typemaking," says the author, and points out that the engravings of the interiors of paper mills throw little light upon the details of papermaking.

In all of the old paper mills, aside from the macerating of the pulp which has been described, there were four other appliances that were common in design and use—the vat, the molds, the felts, and the press. These are seen in all of the pictures of old mills, thus establishing their universality of use. They were made in about the same way. The mold had been given its final basic form by the Chinese, though there were many variations in its make. Its evolution is carefully traced in a chapter all by itself. It was at first, and always has remained, the most important tool of the craft, "and through the centuries in both the Orient and the Occident it remains to this day the chief implement of the makers of handmade paper." And, in its adapted form, he might have added, that the mold is to-day the chief implement in the manufacture of paper by those machines the author has such slight respect and liking for. "The earliest papermakers, the Chinese, probably used a mold made with a bamboo framework over which was stretched a piece of coarsely-woven fabric. As the wet sheet of paper could not have been taken from the cloth, the sheet was dried on the mold and then removed. In this earliest form of papermaking, a number of molds would have been necesary if much paper was to be produced, as it would have required at least a day for each sheet to dry before it could have been removed from the cloth covering." Then some Oriental genius invented a mold from which the sheet might be removed while yet wet; and the first important step in the improvement in the appliances and processes of papermaking was taken, since it enabled the papermaker to form as many sheets, continuously, as he could handle during the whole day —as many as a large group of operatives could get from the same number of the old mold. It is worth while to note just what this epochal improvement consisted of, as it marked a permanent point in the evolution of the mold. "Such a mold covering was made by placing thin strips of rounded bamboo side by side and stitching or lacing them together at regular intervals with silk, flax, camel-, yak-, or horsehair. The bamboo strips, as well as the stitches, left impressions in every sheet of paper made upon the mold. The marks or indentations made by the pieces of bamboo are now known as 'laid-lines,' while the less noticeable impressions of the stitches are termed 'chain-lines,' as the hair lacings consisted of chain stitching over and under the strips of bamboo." The operation of this type of mold is of special interest, since the mold had taken what amounted to a permanent form, and had become a type that has persisted to this very day. And with this we will have to conclude what has been a cursory and insufficient review of the course of papermaking through eighteen centuries. Only a few of the high spots have been indicated.

"The laced bamboo mold cover resembled a piece of matting and when a sheet of paper was to be made, the covering was placed loosely on the shallow wooden framework which supported it firmly; the entire mold, both frame and cover, was then dipped into the vat of macerated pulp and brought to the surface loaded with the wet, fibrous, material. The thin paper stock was prevented from flowing beyond the top and bottom edges of the matting by bamboo rods laced to the mat at its extremities, parallel with the "laid" bamboo strips. The flow of pulp on the right and left sides was kept within boundaries by the workman, who dipped the mold, holding sticks, one in each hand, along the outer edges of the matting, parallel to the "chain" stitches. Thus the four outside edges were fenced in such a way that the wet paper stock or pulp was kept within bounds, forming a sheet of paper almost the size of the mold covering. In couching the sheet of paper the matting was lifted free from the framework and the wet layer of paper deposited flat upon a board, the workman rolling up the mating, from the top edge to the bottom, leaving the moist, tender sheet firm and unwrinkled."

Mr. Hunter's Book a Modern Classic

As to the book, as a book, it merits far better treatment than I can accord it in this connection. I hoggishly have been intent upon tracing the development of papermaking. The book has been made by the printing house of William Edwin Rudge, New York, which also is the publisher. It is a royal octavo of 358 plus xvii pages. It is designed in accord with the best practices of the best book designers. It shows the influence of Mr. Bruce Rogers, who was with Mr. Rudge for a number of years but is now associated with Mr. Emery Walker in London. It is a severely classical example of bookmaking in the midst of an epidemic of "modernity" and breaking away. It is good to look upon; soothes the nerves of the person who has been irritated and discouraged by the carnage of good principles among the bookmakers of this very strenuous period. Its typography is right, and its literary composition is precise without being offensively so. The page design is in exact accord with the classical standards of proportion. It is full of illustrations (214) which are faultlessly printed. The paper is an all-rag of good substance and finish, of what is called a "natural" tint. The jacket is typographically modest, and the binding is a brown polished buckram. In every detail the book is modern, in none is it "modernistic." It is the kind and quality of book

that one obsessed that way likes to pick up and ruffle over the leaves, time after time, after it has been thoroughly read. It is a truly de luxe book, without any of the de luxe trappings of the up-to-date book priced in the class with it; and the price happens to be $17.50; moderate for the book, which has substantial value upon every page.

Developments in Beater Design[1]

By W. F. HATHAWAY

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THE old saying "Paper is made in the beaters" is just as true today as it ever was. An inferior pulp, efficiently beaten, is greatly increased in papermaking value. Conversely, an expensive pulp may be seriously impaired in value by incorrect treatment received in the beater room.

It is the absolute necessity of this beating process that compels the modern paper mill to spend more power for its stuff preparation than it does for the actual formation of the sheet on the paper machine. And when it is known that the power expenditure, per ton of properly prepared pulp, is dependent upon the type of beater employed, the problem of beater design becomes at once of primary importance.

The beating engine accomplishes two functions. In the first, the pulp fiber is cut between two sharp edges, with very little pounding or abrasive action over the length of the fiber. This results in a reduction of the average fiber length of the stock and is termed "cutting" or "shortening."

In the other phase of the beating operation the fibers are pounded and crushed to the extent that they are partially fibrillated and acquire a slimy, greasy feel. Stock of this kind is referred to variously as "wet," "greasy," "fibrillated" or "hydrated." There is some dispute as to what extent this action is a purely chemical or entirely mechanical phenomenon. For the present discussion, however, it is enough to know how the effect is produced. To avoid confusion, "wet" beating will be referred to as "hydration."

The first power-driven beating engine of which there is any record was merely a stamp mill, consisting of rows of heavy wooden hammers which were caused to rise and fall in a pan of rags, by the action of cams on a central shaft. This engine was driven by water power and was commonly used until the invention of the "Hollander" in the Netherlands about 1750. The hollander, then, as today, consisted of an oblong vat, containing a roll at one side, bearing on a bed plate, and obtaining movement of the stock by the installation of a central wall, or midfeather, around which the pulp was compelled to circulate to pass under the roll again, the motive power being the action of the roll itself.

There seems to have been no serious attempt to analyze the action of the holland beater until Frederick Jagenberg in 1887 tried to formulate the principles on which the beating effect of a beater could be determined. Since that time numerous investigators have studied the beating action, with more or less discordant results. Probably the most important discussion of beating problems was contributed by the Danish engineer Sigurd Smith in 1922. His work has met with almost general approval.

Sigurd Smith's Theory Touching Beater Design

Beater design, up to this time, has not entirely outgrown the experimental stage. For instance, one company in connection with their latest type of beaters went through various stages of some thirty-five different models of curbs and backfalls. Sigurd Smith makes this statement—"An apparently unimportant alteration to the shape of the backfall or an unsuitable roll speed may be sufficient to cause an unnecessary waste of power." There are, however, some logical conclusions governing beating conditions which have been generally reached. Most of these center around Sigurd Smith's fibrage theory.

According to this theory, the beating effect is dependent upon the amount and condition of the fibers collected on the cutting edge of the swiftly moving beater bar. By experiment he found that the size of this collection of fibers increases rapidly with an increase in consistency. He also found that at low consistencies the fibers tend to line in a uniform layer, transversely across the edge of the bar, while at higher consistencies they tend to deposit irregularly. The carding action of the bar, that is, the ability of the edge to separate the fibers and deposit them transversely in a uniform layer, increases with the speed at which the bar moves. Even with a heavy bar fibrage, there was found to be cutting action between the bar edges and the bed-plate, the fibers directly in contact with the edge receiving the cutting, and the remainder of the fibrage being hydrated. Increased beating pressure was found to increase the cutting action. Hydration was shown to be influenced to some extent by the surface area of the flat edges of the bark which exert an abrasive and tearing action upon the fiber bundles.

From these experiments it is obvious that to produce maximum cutting in the beater it would be necessary to maintain low consistencies, high roll speed and heavy beating pressure. In present day beater operation, however, the cutting action is delegated to refining engines especially designed for the purpose, while maximum hydration is the aim of the beating process. This is obtained with moderate roll pressure, taking into account the relation between roll speed, consistency, and speed of circulation.

It is a well-known fact that beater circulation is not entirely dependent upon roll speed but to a large extent on other factors, such as shape of troughs, height of backfall, etc. and so, in the ordinary hollander, if it is desired to increase the bar fibrage (and therefore hydration) by an increase in consistency, it is absolutely necessary to increase the circulation proportionately in order to insure that this increased fibrage will be fed to the roll. This has been partially accomplished by redesigning the old hollander tub.

Modern Improvements in Old Hollander Design

The original hollander was very deficient in several respects. It had a flat bottom, low backfall, and the troughs were square and the same width at all points. For these reasons circulation was very poor, necessitating low consistencies, and mixing was imperfect, making it necessary for the beaterman to stand by with a paddle to eliminate the dead spots in the stock. These defects have been remedied by modern beater designers without any radical departure from the original hollander design.

Practically every beater manufacturer is now making a modified hollander, which they designate as a high speed or high density beater. A few of the better known types will be briefly discussed.

One of the most promising is the Niagara beater sold by the Valley Iron Works. This beater obtains good circulation by the use of a high double-plane backfall, specially restricted opening back of the roll, and well sloping trough. It has an automatic doctor set for a clearage of ⅝-inch which jumps with the roll when a lump passes through. The return trough is narrower than the trough containing the roll and this also assists the circulation and mixing. The distinctive feature of the Niagara is its hollow midfeather which permits the rear bearing for the spindle to be placed inside. This eliminates a possible source of friction with the stock, for in the average beater the spindle passes through the stock mixture to a bearing outside the tub. Also, the spindle is shorter and there is less chance for any breakage. The Valley people advertise a power saving of anywhere from 19 per cent to 43 per cent over the old style hollander.

In the Dilts High Speed beater, although the spindle passes through the return trough, it is their contention that it presents no obstacle to the stuff because of its revolving action. They have designed a special tight packing box for the spindle which prevents leakage. A feature is the tapering midfeather which gives a somewhat wider trough at the front than the back of the tub and thereby increases circulation in conjunction with a high backfall, special curb, and sloping troughs. Beaters are built up to 3,850 lbs. capacity and are claimed to circulate a consistency of 9½ per cent. Special reference is made to the location of the doctor. They claim a 100 per cent increase in circulation with no increased power consumption.

[1]Presented before the Kalamazoo Paper Technologists Club.

Dayton, Jones and Horne also manufacture similar high speed beaters. Each of these has a specially designed backfall, curb and trough. Dayton claims a reduction in beating cost amounting to approximately 40 per cent on bond paper. Jones and Horne also advertise very substantial savings.

Noble and Wood, in addition to improved trough and backfall design, feature the addition of a 48-inch propeller, placed in an extension of the midfeather, to increase the circulation. This is operated by a chain drive from the spindle and is claimed to circulate consistencies of as high as 11 per cent. This makes the beater a better color mixer and is advertised as giving an improved product with a power saving of as high as 37 per cent. One desirable point is the fact that in rebuilding a holland type beater the addition of the propeller requires very little change in the tub itself. The propeller operates satisfactorily when the beater is furnished by hand.

The Hayton Pump & Blower Company is also putting out a circulator unit. This operates from beneath the floor of the beater and necessitates some changes in the beater construction. The backfall is cut away and just after the stock passes over the bed-plate it is discharged down into the circulator. From there it passes up into the beater trough again and continues its journey around the trough. A deflector plate just ahead of the roll eliminates unnecessary friction between roll and pulp. The beater may be furnished by lap stock. A material saving of power is advertised.

There are many other beaters of the high density hollander type which are less known. Some have been in use such a short time that a definite conclusion regarding their value is unwarranted while others have been tried and found wanting.

The G. S. Witham Junior beater, which was very recently designed, has some interesting points. The motor is connected firmly to the roll and is adjustable with the roll. The roll and bars are constructed in one piece from Manganese steel and are of unusually light construction. Reference is made to a special doctor blade.

The Shlick Beater features a high backfall, specially designed curb and sloping trough.

Bertrams Patent beater has become quite well-known through the efforts of S. Milne. In this beater the first bar of the bed-plate is directly below the roll center. The bedplate (which is composed of three separate bed-plates) then covers the roll over an arc of 75 degrees. The backfall extends slightly above the center of the roll, while in front of the roll is an efficient deflector plate. The troughs and hood are of modern design.

Other modified hollanders were designed by Crabtree, Carchereux, Schacht, Eichorn and Frase.

Thorsen, Marx, Mitchell and Emerson designed beaters slightly different from the average high density engine.

In the Thorsen beater the stock passes over the roll instead of under it. The roll is fixed, while the movable bedplate exerts its pressure against the periphery of the roll on the front side at a point on a horizontal line with the roll center. The tub is so constricted at the point where the stock meets the roll that it has been described as a conduit. The troughs and backfalls are scientifically designed of the usual type. Marx's beater has two rolls and two bed-plates, one in each trough, and each having its own lighter equipment. This is made possible by a hollow midfeather.

Mitchell's beater is very similar but has a tub of a circular instead of oblong design.

The Emerson beater (not to be confused with the similarly designated high density beater) has two midfeathers with the roll situated between them on a spindle that spans the entire tub. When the stock passes over the backfall it divides, half going to the left and half to the right in two separate channels that lead to the front of the engine. The two streams then unite in the central channel and again approach the roll. This beater is a very good mixer.

The Horne beater is another good mixer and has proved its value by over forty years of service. It is of oblong design with a midfeather in the center but with the roll at one end. The channels are so designed that one feeds under the roll, and, the stock going completely around the roll passes into the other channel to return, making a figure eight movement. A valuable feature is the fact that a wider roll can be used than in the ordinary hollander trough, thus making more beating surface and making it somewhat more efficient for the same circulatory action.

The Rabus beater, although less known, is very similar except for the fact that the tub is of circular instead of oblong design.

In the Umpherston beater the stuff circulates over the backfall, as usual, and then under the combined midfeather and backfall up to the roll again. The roll is fixed while the movable bed-plates are regulated by hydraulic pressure. This is another beater, which, to some extent, has stood the test of time.

The stock goes in a like path in the recently designed Serpas beater. The midfeather is horizontal, but here the similarity with the Umpherston beater ends. The Serpas design has two rolls, one in each end, with the ends of the tub concentric with the rolls. The stock passes around the outside of one roll and over the midfeather, then around the other roll and under the midfeather, making a complete circuit. Each roll is equipped with two bed-plates.

The Acme, Taylor and Tower beaters all have the roll at one end of the tub entirely up out of the stuff for power economy.

In the Acme beater the pulp is fed to the roll by means of an archimedean screw. In the other two a centrifugal pump is the circulating agent. The pulp goes under the roll then back in the central tub again.

Ardledter modified the Tower beater by surrounding the roll with an airtight casing, producing a vacuum on the side opposite the incoming pulp. He is claimed to have greatly increased the circulation. It is said that consistencies up to 30 per cent have been circulated by his method.

The Miller Duplex beater is another of the many attempts to get double beating action with one circulation. The movement of the pulp is similar to that in the Umpherston beater, making a complete circuit around a horizontal midfeather. In this design the spindle is in the midfeather with the roll completely submerged in the stock. As the pulp goes over the midfeather it passes between the roll and a bed-plate on the roof of the tub and as it goes under the midfeather it passes between the roll and a bed-plate on the floor of the engine.

The Jackson, Leicester and Stobie beaters are probably the most radical hydrating machines developed so far.

The Jackson beater consists of "a battery of hammers carried on a central revolving shaft enclosed in a containing cylinder, the sides of which are built up with bars of suitable widths to produce the effects desired by receiving the impact of the hammers as they revolve centrifugally expanded."

In the Leicester engine the stock mixture is thrown violently against bed-plates by centrifugal force.

The Stobie engine has practically the same principle. In this design, stock at 2.5 per cent consistency is pumped to a series of nozzles directed at a serrated plate which is tilted to throw the pulp back in the chest. The stock is projected with a force of 75 pounds per square inch. A. B. Green computes, roughly, that this engine would give a power saving of about 67 per cent.

Hollander Has Variety of Uses

So far, in this discussion, about 20 distinct designs of beaters have been mentioned, of which some half a dozen have enjoyed a certain degree of popularity. In considering those types which have been definitely discarded it is difficult to decide, on theoretical grounds, just why each has failed. Often, the reason has been an unsolved mechanical problem, faulty construction or poor choice of materials, rather than any inherent deficiency in design. Many of these beaters operate efficiently on certain kinds of stock and under certain conditions but in the varying routine of the average mill have failed in competition with modifications of the hollander which is a sort of jack-of-all-trades of the paper industry.

The hollander or its modifications can be used as a bleacher, washer, thickener, shredder, breaker, hydrator or refining engine, as well as a mixer for the convenient additions of color, size and loading materials. It is simple in design, does not

require a great deal of skilled labor to operate it and can turn out any kind of stock from blotting to glassine.

Although the hollander meets changing conditions satisfactorily it does so with an extravagant disregard for power consumption. It is certainly surprising if no one can improve on a machine which pumps a viscous mixture of 2,000 pounds of pulp and 26,000 pounds of water a distance of a half mile, around more than 250 sharp bends, in order to pass it over a scant 85 feet of bed-plate length. These figures are calculated only roughly but serve to show some of the inefficiency of the type of beater in general use today.

Other Machines for Special Uses

Probably the solution lies in substituting specialized machinery for each step of the process now executed by the beating engine, the steps including a shredder, pulping machine, in connection with a pre-hydration tank, a continuous hydrating engine and a continuous refiner. This necessitates intensive specialization of paper grades but is only the natural tendency in the industry anyway aside from all beating problems.

There are several possibilities in the choice of continuous hydrating machinery, although this type of engine has not yet come into such general use that very reliable figures are obtainable.

The jordan is one obvious possibility. Jordan manufacturers have furnished figures from time to time which indicate that with correct use, and under definite conditions, the jordan proves a very efficient hydrating engine.

The rod mill is also worthy of attention. In the **Paper Trade Journal**, in 1926, John Rue and Sidney Wells favorably discussed their studies with an open end mill. They described an engine six by twelve feet in size containing 42,000 pounds of steel rods from two to three inches in diameter. This was rotated at 14 r.p.m. while stock at 6 per cent consistency was fed in at one end. In a kraft mill an engine of this size had a capacity of 12,000 pounds in 24 hours. The Fletcher Paper Company, on glassine, reports a considerable power saving with improved quality of the sheet.

There are other types of continuous hydrating machinery on the market, a notable example of which is the Vertical Hydrator. This machine consists of a cylinder in a vertical position 3 ft. by 13 ft. in size. It is built in ten sections, each section containing both a movable and a stationary disk, between which the beating action takes place. Stock at about 5 per cent consistency is pumped to the top of the machine and flows downward by gravity. The hydrator is guaranteed to handle a minimum of three tons of stock an hour, the machine to be driven with a 100 hp. motor, and to give a strength increase of 15 per cent on one passage through the machine with not over 1½ hp. input per ton.

The Munising Paper Co. has run this machine on milk cap stock, kraft, screenings from a pulp mill and old paper stock as well as sulphite. They report a power and time saving with improved quality. This engine appears to be a valuable contribution to hydrating machinery design.

Wood Collections for Study and Display

The Virginia Polytechnic Institute, Blacksburg, Va., through its department of Wood Technology, according to Professor J. Elton Lodewick, has prepared sets of wood collections, each collection containing 40 woods, for study and display. Each block in a set is 4½" x 2⅝" x ½" and bears a neat label upon which is given the common and latin name of the wood, where it grows, and a list of its principal uses.

A complete set, packed in a gray cardboard box, includes blocks of the following woods: Northern white pine, western white pine, sugar pine, western yellow pine, loblolly-pine, shortleaf pine, longleaf pine, red spruce, sitka spruce, hemlock, Douglas fir, redwood, cypress, southern white cedar, Port Orford cedar, red cedar, butternut, black walnut, hickory, pecan, cottonwood black willow, birch, chestnut, red oak, white oak, elm, magnolia, yellow poplar, red gum, sycamore, cherry, locust, hard maple, soft maple, buckeye, tupelo, white ash.

Further information as to prices and terms may be obtained by addressing the Institute.

Control of Grinder Operation in the Manufacture of Mechanical Pulp[1]

By L. E. KENDALL

Abitibi Power and Paper Co., Ltd.

IN 1912 Thickens, in writing Bulletin 127 on grinding of spruce for mechanical pulp, introduced his subject as follows:

"The commercial manufacture of groundwood pulp is generally not conducted according to any fixed standards of practice." In the intervening eighteen years a lot of work has been done on the factors affecting the manufacture of groundwood, but even at present, after the work of Thickens and those who have followed, there remains a lot of uncertainty and variation in the manufacture of groundwood pulp. It is unnecessary to cite examples of these variations which exist in regard to all the factors involved in the process. Some of these variations are inherent in the process and must be counteracted by the intentional variation of the secondary factors.

Thus we have primary variations in (a) wood supply; (b) stone supply; (c) power.

These variations should be offset as far as possible by controlling the following factors in the manufacturing process: (a) pressure per sq. in. of pocket area; (b) peripheral speed; (c) temperature of grinding; (d) consistence of stock in the stone pit; (e) burring or stone surface.

It is now necessary to discuss and fix if possible the qualities required in mechanical pulp. This pulp is used for many purposes, and it might be expected that as many various qualities would be required, but the most important, especially to this assembly, is its use in the manufacture of newsprint and any general laws laid down will cover the broader field of requirements for use in other papers.

Mechanical pulp is a mixture of fibers and at present it is general to distinguish one mixture from another by testing them for freeness and strength, or by a blue glass examination.

In the end these tests depend on the dimensions of the individual fibers which make up the mixtures and the proportions of different kinds in the mixtures. The dimensions of a fiber are pretty well covered by its length and diameter, allowing, of course, that certain fibers may be flattened out or even brushed into fibrils and that length and diameter would not wholly designate them.

So if we vary the length and the diameter, or the ratio, of one to the other, we can expect a change in freeness or strength, or ultimately in the papermaking quality of the resulting pulp.

Our object may be stated to be: To make, as economically as possible, a pulp that will make satisfactory paper. It must be strong enough that a sheet of adequate strength can be made with a minimum of sulphite. It must felt properly, and fill the sheet so that finish and printing quality will be right. These requirements again are reflected finally in the individual fibers and are dependent on length and diameter of fibers.

In a general way we desire a pulp to make paper of a given strength, finish, formation and printing quality, this pulp in turn to have the necessary qualities of strength, freeness, and mixture of fiber content. This pulp must be made of a varying raw material, using a varying tool (the stone) and varying power. In order to do this there are further factors or conditions that can be varied to give the required results. It is proposed to discuss first the variations in wood and stones and following that the interconnection between these and the controllable factors.

Wood Quality

The principal division in pulpwood is between spruce and balsam, but there is also a general division of wood on some scale such as hardness, density or rate of growth. It is true that balsam is generally softer, less dense and faster grown than spruce, but there is much variation in each species and

[1]Read before the Technical Section of the Canadian Pulp and Paper Association at the annual meeting in Montreal, January 29, 1930.

they overlap in a central zone; so then if we can develop a scale to measure wood quality in regard to grinding, probably small slow grown hard spruce would be toward one end of it and big quick growth balsam toward the other with the quick growth spruce and slow grown balsam overlapping in the central range. Rate of growth has been taken here as an example, but is it at all certain that rate of growth is the best measuring stick? It may be hardness as measured by a tester, such as the Brinnel machine, or some other quality that has yet to be designated.

It will certainly be necessary also to differentiate between the hardness of pulpmaking quality of a green stick, due to slow growth and high density as compared to hardness of a comparatively fast grown stick that has been seasoned out of water and is sun baked. These two "woods" certainly require different treatment to get the best possible pulp out of them. Conditions that would produce a fine fiber of fair length on the former probably would produce a shorter fiber with a chunky body on the latter wood.

This matter of wood quality requires a lot of clearing up, and it is hoped it can be seriously studied by the Forest Products Laboratory.

This problem of wood quality requires two things:

(a) A scheme laid out ahead to cover all variations of wood that the mill is required to handle.

(b) Close communication between the grinder room and woods department as well as between grinder room and wood room.

In this way any upset, caused by unforeseen wood changes can be minimized. If the groundwood mill superintendent does not handle the wood room, he should keep a close watch on the wood supply.

So far there seems to be no test or scale on which wood quality can be given a numerical value, but it is understood that certain mills are starting to weigh the supply of wood to their grinders. This work requires moisture and density tests, so we may hope that from these data the mills may develop a measure of wood quality in relation to its pulp producing quality.

The control of the quality of pulp from various "woods" depends on stone face, grinding pressure, peripheral speed, temperature, etc., and will not be discussed here.

Pretreatment of Wood

This is not going to touch on semicooked or steamed groundwood. Rather in what condition do you get your wood? In the preceding paragraph a range of wood has been mentioned, but that range can be variously modified by delivery schedules. Note the following possibilities:

(a) Summer cut and immediate delivery by rail or truck with no watering or seasoning.

(b) Winter cut and immediate delivery to the mill in a frozen state.

(c) Winter or fall cut and delivery by water, either next spring or fall or possibly the second or third season afterwards.

(d) Wood delivered as in (b), but piled unbarked for use the next summer or following winter.

(e) Wood delivered as in (c), then piled rough or peeled for use the following winter, or even a summer or two after that.

Each mill has its own combination of these conditions and undoubtedly each builds up a technic or system to take care of its own changes. No attempt will be made here to lay out specific remedies, for after all you have the same standbys—stone face, grinding pressure, peripheral speed, temperature and pit consistence to use in correcting or offsetting these changes, and it is the basic effect of each of these that will determine the necessary action to be taken.

Stone Face

Here we have probably the most important of all the factors influencing the quality of pulp that can be obtained from any given wood.

The stone face depends on three factors: (a) size of grit; (b) bond; (c) burring.

Of these (a) and (b) are primary and (c) is secondary.

(a) Size of Grit—It is usual to designate grit by the mesh of the screen on which it is retained in passing through a standard set of screens. The best natural sandstones are made up of a mixture of grains of various sizes. These run from grains retained on a 14-mesh screen to fines, retained on 150 or 200 mesh screens. Last winter at New York, the Norton Company published the screen analysis of their artificial pulpstones and you will have noticed that they omitted the extremely course and extremely fine portions of natural stones. On the other hand, their stones are each composed of a combination of grits. Actually their granulometric analyses follow very closely the central portion of the analysis of several well-known natural stones. Their practice in making their stones in the central range of grit size of natural stones is undoubtedly correct. A 14-mesh grit for instance is a pretty husky character. It is probably dug out by the burr, leaving a big cavity which will mean an inactive area with a tailing cutting edge behind it or if left in the stone it will cut tailings regularly until knocked out. At the other extreme, the fines cannot produce anything but flour.

If the reports of the News Print Service Bureau on Pulpstone Efficiency for 1926-27 and 1928 are analyzed, it will be found that a very few stone companies supply the greater percentage of the stones reported by the pulp manufacturers, reporting. Also it can be shown that the granulometric analysis of stones from these companies are pretty much between Norton standards 36 and 46.

It appears that experience has led most stone users to demand stones that are within very close limits of granulometric analysis and it is quite evident that those mills who, when purchasing stones, pay the most attention to their pulpmaking qualities are those who get the narrowest range of stone grits. If purchasing is done on the price basis alone they will undoubtedly get a much wider range of stone grits.

When Norton stones were first tried out, they were comparatively coarse, 24 and 30 grit, and you probably heard the claim made that different burrs had little effect on the kind of stock produced by these stones. Lately there have been much finer stones put into use and they are finding that various burrs produce different stocks. This is possibly a basic idea to keep in mind, namely, that coarse stones cut on the grit while finer stones cut on the burr marking.

The life of pulpstones unquestionably rests with the user. The report of pulpstone efficiency, previously referred to, shows plenty of examples of the same make of stones, giving very markedly different periods of life at different mills. This will be further discussed under temperatures.

Now let us turn to the factors with which the manufacture can control the quality of pulp to be made.

Pressure Per Square Inch of Pocket Area

For purposes of comparing pressure conditions on various grinders, it is essential that pressures per square inch of pocket area be used, as the relation between cylinder pressure and actual grinding pressure varies with different installations. In reducing cylinder pressure to grinding pressure, the amount lost in packing friction may vary considerably, but as it is seldom measured, we must assume it as constant for the time being.

It is amply proven that stones cut more pulp at higher pressures and require less horsepower per ton than at lower pressures. So far the difficulty has been to compare the papermaking qualities of pulps ground under different pressures. With a given wood condition, the same freeness and the same strength tests of pulp can be obtained over quite a range of pressures, but as the pressures increase, it is increasingly difficult to control the pulp quality.

Undoubtedly, harder and denser woods require higher pressures and this should be recognized in any operation by varying the grinding pressure to accommodate changes in wood, but at all times keeping it as high as possible to get the maximum advantage of production and saving in horsepower per ton. The average operation of pocket grinders is probably between 25 and 30 lbs. per square inch, while the caterpillar grinders probably run higher.

In the caterpillar grinders, as ordinarily equipped, there is no direct measure of grinding pressure. This can be calculated by assuming a coefficient of friction, but it is not at all accurate. On the other hand most caterpillar grinders

operate at higher ratings than pocket grinders, that is, the horsepower absorbed and the tons produced per square inch of pocket area are higher than in pocket grinders. Therefore, when making pulp of the same freeness, they must operate at higher pressures.

Speed

There is no definite information available as to the safe speed for operating pulpstones. An example is known of stones operating at 6,000 ft. per minute, with poor regulation and this went on for several months. It is probable that most stones, if other conditions are right, can be operated up to 4,000 or 4,500 ft. per minute with synchronous motor drives. Similar speeds with water wheel drives might cause trouble due to variations in speed during regulation. In the case of artificial stones there is not likely to be any trouble with any speeds that will be used for making pulp, providing they are not subjected to sudden accelerations in speed.

The work done on speed in relation to pulp production and quality is very inconclusive.

In an unnumbered bulletin on grinding jack pine and hemlock, about 1912, Thickens claims that speed makes very little difference in the resulting pulp fibers, but that it effects the quantity produced.

In Bulletin 343 by Thickens and McNaughton, dated 1916, they show again an increase of production with increased speed, but it also shows a decrease in the horsepower per ton required and altogether likely this was accompanied by a lower pulp quality. They also claim that stronger pulp is obtained at conditions of low speed and high pressure than is obtained at conditions of high speed and low pressure. This indicates that they probably obtained a longer pulp at low speeds, also a pulp that would contain thick bodied fibers, due to the high pressure. This is a point that needs considerable investigation to determine the laws governing these relations. We are using a great many combinations of pressure and speed and of course have in most cases fixed speed conditions built into our plants. However, any plant where the grinders are driven by hydraulic turbines whose speed power characteristics are flat may, to considerable advantage, vary the r.p.m. of their grinders to compensate for the wearing away of the stones. This will tend to increase the uniformity of their pulp production and quality.

Temperature

Temperature is undoubtedly the worst enemy of pulpstones, more particularly variations in temperature.

Experiments have shown that temperature changes through a pulpstone are comparatively slow and it is also known that stone temperatures are sometimes suddenly run up very high. The high external temperature and the comparatively low internal temperature result in excessive internal strains being set up in the stones which give the well-known failure of slabbing and scaling. Of course, some stones fail sooner than others under the some conditions of operation. Temperature stresses in stones can only be guarded against by detailed attention given to each stone. Up to a certain point the control of temperature can be taken care of by varying the amount of shower water and the consistence of the stone pit, but is must finally be controlled by treating the stone face. In regard to the effect of temperature on stock quality and production, it should be fairly well established that hot grinding is preferable, as consuming less power and producing longer pulp. On the other hand we require quantitative measures of the effect of temperature on pulp quality.

Consistence of Stock in the Stone Pit

This is closely allied to temperature of grinding. The first general distinction is the same as between hot and cold grinding. In hot grinding the stock in the stone pit is kept thick by small use of shower water, while in cold grinding excessive shower water reduces the consistence of the stone pit and keeps the temperature down. In all these, stone sharpness, shower water and temperature are interrelated. For a given stone face the temperature will increase as the consistence in the pit increases, but as the stone face changes, the relations between temperature and consistence change. For instance, a very sharp stone can operate at maximum set temperature with a high consistence, while a dull stone to operate at the same maximum temperature must have a thin stock in the pit.

For any given stone face, the production of pulp varies as the consistence of the pit and the temperature of the stock. Therefore, as a stone face wears down, the temperature can be controlled by changing the grinder pit consistence until the pit becomes so thin that the production of the stone has been impaired, then it is necessary to sharpen the stone. As far as possible the pit temperature should be kept uniform. A sharp stone that is run at a low temperature in order to keep stock moving in the pit has probably been sharpened too heavily. It would be better to sharpen lighter and run nearer the maximum desirable consistence and temperature. Pulp produced in a thin pit will give a better finished sheet but at a cost in production.

Burring

With the coarser stones that were used formerly and the quality of pulp demanded, it was sufficient to keep the face of the stone open to prevent it glazing over. As the demand for better pulp grew, finer stones came into use, both for the pulp quality demanded and in order to stand up under the heavier loads that were required. With the finer stones, it was found that the quality of the pulp could be controlled by varying the pattern cut on the face of the stone and also by the depth of the markings. At present, burrs in use extend from straight fluted burrs of no lead to thread burrs of an extremely long lead, say 25 inches to 30 inches.

Of these, for an equal number of cuts per inch, the thread burr will cut the shortest fiber and the straight cut burr, the longest fibers. Therefore, the latter should be stronger. In regard to cuts per inch, the finer cut burrs will cut finer (smaller diameter) fibers than the coarse cut burrs.

Thus, cut of the burr influences the diameter of the fiber and the lead of the burr, its length; so by varying the combination of cut and lead, any desired tendency of fiber quality can be obtained. These combinations will vary for different woods and probably should vary for different stones though it is probably better to keep stone quality or grit size as uniform as possible to allow the use of one burr on all stones if possible.

In this connection a diamond burr is a good example of these tendencies. The diamond burr being cut in two directions, making points on the surface has the qualities of both thread and straight cut burrs. It makes the shortest stock and the chunkiest fiber that will be obtained by a similar cut. Thus a 10-point diamond burr tends to cut stock of the same length as a 10-cut thread burr and of the same diameter as a 10-cut straight burr. The diamond burr applied lightly and often to keep the stone face open gives a high production, but in this connection an example of its use and bad effect was published recently in the **Wood Pulp News**. The Escanaba Paper Company started up a Norton stone and tried out various burrs. They found they had to discontinue the use of a diamond burr to get the best stock and when the stone was too free they used a dull burr to bring it back. The dull burr knocks down any high points that may be cutting tailings and if used carefully does not injure the main pattern.

The depth of burr cut and its shape influences the quality of pulp produced. The depth of cut is generally controlled by hand though attempts are being made in various places to measure this factor. Some are attempting to measure the actual depth of cut and others to measure the pressure with which the burr is applied to the stone. Considerable experimental work along these lines should be carried out, for if the mills can get some device for measuring either of these accurately, there will be opened up valuable means of controlling pulp quality.

In regard to burr teeth, they were formerly cut much as a thread with a broad base. That made a sharp edged ridge on the stone. At present the practice seems to be toward a thin bodied tooth with a flat space between the roots of neighboring teeth. These leave flat topped ridges on the stone and make a better pulp. Also the burrs are good for more sharpenings, as they retain a thin edge longer.

Summary

(1) Mechanical pulp must be manufactured under various conditions, owing to raw materials of varying qualities.

(2) The variations in raw material are in the wood and the stone.

(3) Wood varies, as a consequence of species rate of growth, density, and also by time of cutting, delivery methods as well as period and method of storage. These are fairly closely fixed by economic reasons, so must be counteracted by skilful employment of the controlled variables of the process.

(4) Stone grit and bond have an important influence on pulp quality, but these can be and in many cases are overcome by purchasing pulpstones of a uniform grit. Statistics indicate that the larger proportion of the stones used for newsprint pulp are supplied by a limited number of stone companies and that their products are uniformly of a similar nature.

(5) The controlled variables mentioned above are: (a) Pressure of grinding; (b) peripheral speed; (c) temperature and consistence in stone pit; (d) burrs.

(6) Pressure of grinding influences production and quality. While a high pressure is desirable for production, it is limited by increasing difficulty in maintaining pulp quality. The maximum permissible pressure is a function of some quality of the available wood supply and the quality of the desired pulp.

(7) Peripheral speed influences tonnage of production, but as far as is known has small influence on quality within ordinary ranges. However, it is believed that the higher speeds make a shorter fibered pulp.

(8) While hot grinding is generally used, stone face, temperature of stock and consistence of the stone pit are closely related, and for any given stone face there are limits of temperature and consistence that should be followed.

(9) Burrs vary as to cut and lead. The cut of the burr influences the body diameter of the fiber and the lead influences fiber length. Thus by choosing different combinations of cut and lead, considerable control of pulp quality is obtained.

(10) In spite of the advances of recent years in equipment and in process control, grinding wood for mechanical pulp remains largely an art. It appears that many factors can be put under control by experimental work, so that more and more the groundwood mill may produce at all times the uniform quality of pulp required for the economical manufacturing of newsprint.

New Committee of the Technical Association

Ronald G. Macdonald, secretary-treasurer of the Technical Association of the Pulp and Paper Industry, has issued a statement concerning the appointment of a new committee on patents which reads as follows:

"Our patent system is without question the best method that has thus far been devised to stimulate and encourage ingenuity and inventiveness. This it does by endeavoring to secure to worthy inventors a reasonable compensation for the time, effort and money that they may have expended in making available to the public something of practical utility. The words 'endeavoring to secure' are used advisedly. For, in a large number of instances the inventor receives little or no return for his contribution to the arts and sciences. The chief reason for this rather unfortunate state of affairs is that the system has developed some very serious defects which, in most cases, work to the detriment of the honest inventor, who as a rule does not know enough of the fundamental principles of patent law and procedure to avoid the many obstacles and pitfalls that are interposed in his path.

"The procuring of a patent has become an involved, complicated and long-drawn-out proceeding in which the skill and experience of the attorney often play a more important role than the merits of the invention. Then again, there is at present entirely too much needless uncertainty in relation to both the validity and the scope of patents. This is due in large measure to the complicated procedure in the Patent Office and to the fact that patent suits must often be tried before judges who have no previous knowledge of the subject and who in many cases are without technical education.

"Concerted action on the part of the inventors and technical men of this country is most urgently needed to ameliorate and rectify the glaring defects in the system. Such action is only possible through the various technical associations and their patent committees. Hence the Technical Association of the Pulp and Paper Industry, many of whose members are prolific inventors, has organized a Patents Committee."

The Association's Committee on Waste, C. M. Baker, chairman, has drawn up a program of activities for 1930. It is the object of the committee to collect information and from this draw definite conclusions concerning the various factors and problems in relation to white water utilization in the various branches of the pulp and paper industry. To this end the active co-operation of every member of the committee is urged.

Tappi Fall Meeting at Erie

Members of the Technical Association of the Pulp and Paper Industry in Erie, Pa., arranging for one of the largest fall meetings in the history of the organization at the Lawrence Hotel, Erie, on Wednesday, Thursday and Friday, September 3, 4, and 5, 1930.

There are few more accessible paper mill centers than the home of the Hammermill Paper Company on the main line of the New York Central Railroad between Buffalo and Cleveland. Erie is a great industrial center and at the same time it is a summer resort famed for its summer breezes from Lake Erie and Canada.

The local committee of arrangements has outlined an unusually well balanced program of subjects for discussion, plant visitations, recreation and get-togethers that will make it distinctly worth while for every mill executive, superintendent, engineer and chemist in the industry to attend.

The chairman of the local committee is Henry F. Obermanns, general superintendent of the ammermill Paper Company.

Other committees in charge of various activities have been named as follows:

Administration—F. P. Klund, chairman; J. A. Bowers, W. F. Bromley, P. W. Herrick.

Progam—Bjarne Johnsen, chairman; C. R. Tait, A. O. Spierling.

Publicity—John L. Parsons, chairman; Earl Neubig, H. B. Dawson.

Subcommittee of Arrangements—C. H. Reese, chairman; H. M. Holmes, Eric Wahlforss.

Erie is well equipped with hotels. The Lawrence Hotel, the largest in the city, has been designated as general convention headquarters, but comfortable and convenient accommodations are to be had at both the Ford and Reed hotels. Members should in every case make their reservations directly with the hotel of their choice.

Since the accommodations at the headquarters hotel are limited, those desiring reservations at the Lawrence should make them promptly. Garages are convenient to all hotels. Additional information regarding accommodations may be obtained from C. H. Reese, Hammermill Paper Company, Erie, Pa.

Major Carpenter Returns from Business Trip Abroad

Major Aaron E. Carpenter, first vice-president of E. F. Houghton & Co., Philadelphia, has just returned from an extended business survey in France, Germany, Poland, Russia and England. He reports a successful trip, revealing the true state of foreign business and providing valuable data on European manufacturing and market conditions. Major Carpenter found that on the whole business was only fair in the countries visited by him, inclining to poor in some sections.

L. E. Murphy, president of E. F. Houghton & Co., has just sailed for England to decide definitely the site of a proposed plant in England, two locations being under consideration, one in Liverpool and another in Manchester. Mr. Murphy will also make a general tour of inspection of existing factories while abroad.

P. H. Glatfelter Company to Use 350 lb. Pressure

Increase in Pressure and Capacity Will Meet Demands in Rapidly Growing Plant

INCORPORATION of 350 lb. pressure boilers with superheaters, economizers, forced and induced draft fans, along with water walls and pulverized coal, the new power plant of the P. H. Glatfelter Company will represent the most modern practice in power plant design.

The P. H. Glatfelter Company located at Spring Grove, Pa., was organized in 1864 by P. H. Glatfelter, grandfather of the present president. Machines were installed at that time to give production of 4,000 pounds of paper per day, which consisted chiefly of newsprint. By 1900, the installation of several new machines had increased production to 80,000 pounds per day, and the plant had changed from newsprint to book and bond paper.

In 1907, W. L. Glatfelter became president, and under his direction in 1922, a new 170-inch machine was added, which increased the production to 200,000 pounds per day.

W. L. Glatfelter died April 20 of the present year, and P. H. Glatfelter succeeded him to the presidency. At this time the company had under consideration an additional 190-inch machine, which will bring the capacity of the mill up to 300,000 lbs. of paper per day, and permit the production of paper to maintain an ever increasing high standard.

The present boiler plant, which was installed in 1907, with the addition of one boiler in 1920, proved inadequate to handle the increased demands for steam for the new paper machine, or to furnish the extra power which will amount to about 1,500 kw.

At the time this plant was installed, the design was considered to be the most modern and up to date for industrial practice. However, with the rapid changes and strides made in power plant design, the operation of numerous units by means of natural draft stokers at 150 lb. pressure, showed a marked difference in efficiencies.

The central stations have grasped every opportunity which modern engineering methods have brought to the fore to gain extra efficiency made possible by larger boiler units, higher pressure steam and the increase of superheat. Old plants have been discarded to make way for the up to date central station, so that the general lagging behind of the industrial steam plant has furnished in numerous cases, opportunity for the public utilities to supply their needs.

Mr. Glatfelter and Mr. Troop, the latter being power engineer, realizing the importance of the modern developments in power and steam generation, made a study of their own operation, and called in H. M. Wilson Company, of Philadelphia, engineers and constructors, to furnish them with a thorough report on modern applications in connection with their needs. This report showed that they could successfully make power up to the steam demands of the plant, using a 3,750 kv. a. turbine, extracting at 25 lb. back pressure, the increase in pressure producing all the additional power necessary for the operation of the new 190-inch paper machine.

A modern installation of this type, with its increase in boiler and turbine efficiency, together with the advantage gained in fuel economy, at the same time makes possible the securing of increase in capacity at operating cost considerably below the present total.

The new boiler room will be of brick, with interior walls laid up in glazed tile. Space will be available for an additional unit adjacent to the two boilers now being installed.

The design calls for pulverizers located in the basement, with only the feeders on the firing floor, this giving the plant an attractive and roomy layout.

Boilers themselves will be of the cross drum type, an excellent idea of the general arrangement of the equipment may be had from section shown on the accompanying sketch. The units will be rated 1,138 hp., and will be fired by means of two pulverizers, either of which will be capable of operating the boilers at 225 per cent. Continuous operation of 115,000 lbs. of steam per hour will be available, with peaks of 130,000 lbs.

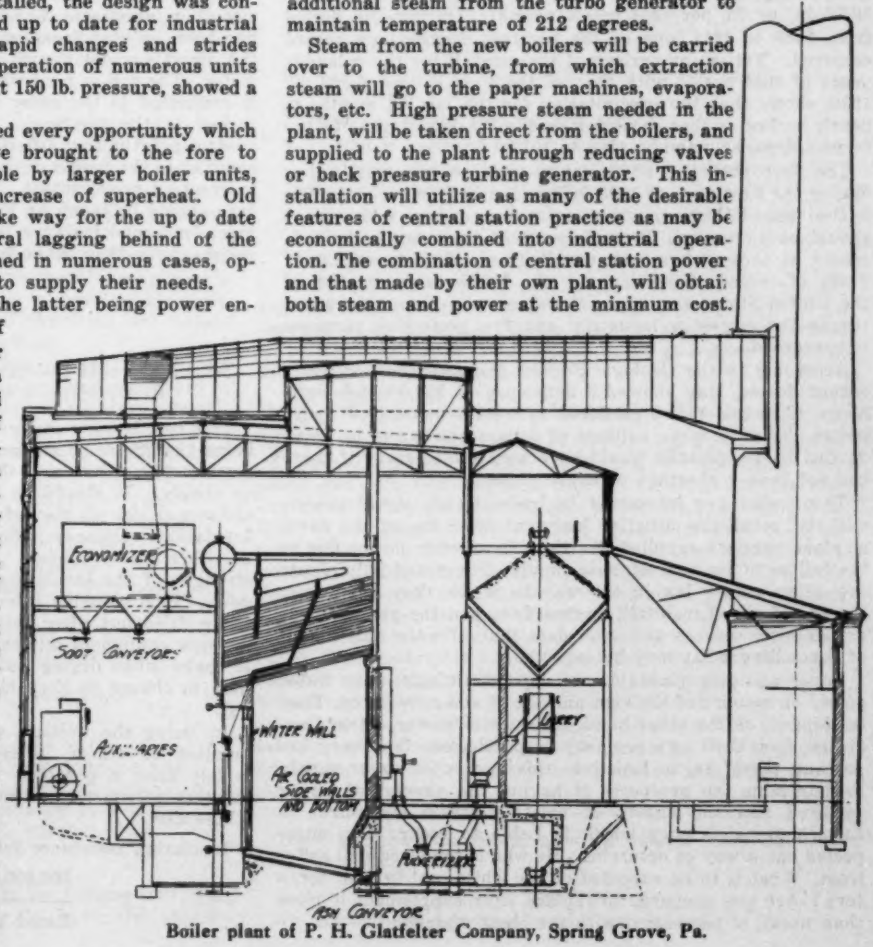
Furnaces will be designed to give maximum of turbulent burning, and will be a combination of air and water cooled construction, with B.t.u. release of approximately 20,000 at the continuous maximum rating.

A unique feature of the installation will be the handling of ash and soot, arrangements being perfected whereby most of the fly ash will be precipitated and this ash handled by a vacuum method direct to the storage bin.

All firing will be done by means of full automatic control, with instruments available to keep check on the complete operation, efficiency and economy. Boiler panels will be erected on the firing floor, upon which will be mounted the flow meters, CO_2 recorder, draft gauge, watt hour meters, etc., together with the controllers for the forced and induced draft fans.

Feed water will be passed through economizers, after same has been treated by means of zeolite water softener, and carried from there over to a deaerating type of feed water heater. Temperature of the feed water will be secured by the exhaust from the boiler feed pumps, continuous blow down, etc., with provision made for automatically supplying additional steam from the turbo generator to maintain temperature of 212 degrees.

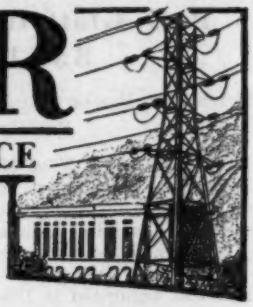
Steam from the new boilers will be carried over to the turbine, from which extraction steam will go to the paper machines, evaporators, etc. High pressure steam needed in the plant, will be taken direct from the boilers, and supplied to the plant through reducing valves or back pressure turbine generator. This installation will utilize as many of the desirable features of central station practice as may be economically combined into industrial operation. The combination of central station power and that made by their own plant, will obtain both steam and power at the minimum cost.



Boiler plant of P. H. Glatfelter Company, Spring Grove, Pa.

POWER

GENERATION - UTILIZATION - MAINTENANCE



By W. S. JOULE

This section turns the searchlight upon power and its allied problems. It shows up big possibilities to save. Opportunities to improve conditions, methods, apparatus will be discovered. Worth while practices suggest new ideas and wider usages of equipment.

Does a Water Shortage Threaten?

WATER works engineers in many parts of the country are apprehensive of a water shortage in the near future. While water works engineers are better able to handle storage against a future shortage than those using water for hydroelectric purposes, the paper and pulp engineer can "do his bit," to minimize the flow of water through his plant and utilize as fully as possible what is used.

Extremely low rainfall has taken place in certain parts of the country during the last twelve months. For example, in New England while every month from June to November, 1929, inclusive was below normal (aggregating a total deficiency of 6.12 in. in six months) during the first five months of the year of 1929 the precipitation was 3.81 in. above normal. Consequently, the deficiency during the months of this year have not been realized at their true significance. From May, 1929, to April, 1930, the total precipitation was 29.38 in. or 10.76 in. or 27 per cent below normal. During the period from 1908 to 1912, one of the severest droughts on record occurred. Yet, a comparison of the rainfall for the calendar years of that period with that of the year ending April 30, 1930, shows that the precipitation for the last 12 months is nearly as low as that occurring during the lowest year of the former drought, namely, 1908 to 1912.

The fact that the precipitation was so abnormally low during the first part of 1930 is, itself, a bad omen, since this is the time of the year when ordinarily pondage and storage should be increasing. In some parts of the country the deficiency at present has been equalled only 4 times within 67 years of record. Conditions for the Northeastern section of the United States are indeed threatening so far as the water supply for domestic, industrial and fire protection purposes is concerned.

According to the Geologic Survey, the deficiency of hydro output during May showed a deficiency of 250,000 kilowatt-hours, that had to be produced by steam instead of hydro power. To date, some millions of dollars has had to be spent on fuel that ordinarily would have been unnecessary if there had not been a shortage of hydro power.

Those who are interested in hydroelectric developments will still recall the situation last year when one of the naval airplane carriers supplied Seattle with electric power due to the failure of its hydroelectric supply. Paper and pulp plants are often rather lax in the way in which they keep their records of runoff, rainfall, stream flow, and the year-by-year dry and wet seasons and other data that offer the only means of foretelling what may be expected.

Paper and pulp plants do not depend, entirely, upon water power on account of the vast amount of steam required. They do depend, on the other hand, upon water power, either generated upon their own property or purchased. It is very important, therefore, to look into this matter of water supply to determine the prospects of having the amount of power required and the ability of existing steam equipment to furnish any deficiency which is liable to occur. The unexpected has a way of occurring. He who is prepared will suffer least. What is to be expected of the white coal in your territory? Are you prepared to replace it or supplement it more than usual, if necessary, with the black diamond?

Checking Up Insulation Resistance

BEFORE starting up new electrical apparatus it is always advisable, of course, to determine the resistance of the insulation. It is also well to do this before starting up apparatus that has undergone extensive overhauling or repairs, particularly where moisture from condensation, leaks or drippings may have had an opportunity to reduce the insulating values of the insulation.

The megohmmeter or megger or bridge is often used for this purpose. However, there is a very much more practical method available, especially for out-of-the-way places where ordinary laboratory apparatus is not available.

By using a direct-current source of supply together with a high resistance, direct-current voltmeter, the insulation can be very readily found so long as the resistance of the voltmeter is known as well as the voltage of the direct current supply. Direct current source of supply is connected to the circuit or apparatus which is to be tested after this latter has been isolated from earth or ground. The other side of the direct current circuit is connected to the portable voltmeter. The volt is read when the free sides of the instrument is connected to the other side of the circuit where is it attached to the winding. The voltmeter terminal, plate or contact point is then lifted off the insulation and connected to earth or to the frame of the machine, special care being taken to create a good contact. The voltage reading in the former case should be taken as V, the voltage shown by the instrument in second instance being shown by V_1. The insulation resistance is then given by the formula:

$$R = R_1 \left[\frac{V}{V_1} - 1 \right]$$

Where R = cold resistance of insulation;
R_1 = resistance of voltmeter

This test is very easily carried out, the only requirements being that there be a source of direct-current available (preferably 250 volts) and that the supply be fairly constant or steady. It should be borne in mind that insulation resistance is not all the information required about insulation. Insulation resistance indicates to what extent the insulation is either dry or moist. It does not indicate the potential strength of the insulation nor whether it is about to break down. It is valuable information to have when equipment is being dried out after being submerged in water or in placing new equipment into service. The test is a very useful one to make when drying out apparatus because it enables the man in charge to keep close tab on the progress of drying out.

In using the voltage measurements for determining insulation resistance, there are two rules which have been widely used in practice. These rules give the value of insulation resistance as usually understood to be satisfactory. These are:

Insulation resistance for alternating current generators;

$$R = \frac{300{,}000{,}000 \times \text{Rated voltage}}{\text{Rated kilowatts}}$$

Insulation resistance for direct-current generators and exciters:

$$R = \frac{300{,}000 \times \text{Rated voltage}}{\text{Rated Current}} + 150{,}000.$$

The above equations give the insulation resistance in terms of ohms. Usually, however, insulation is expressed in terms of megohms which is millions of ohms. The above formula can be reduced to megohms, however, by dividing the result by one million.

Getting the Most Out of Paint

"SAVE the surface and you save all," has been made famous by paint manufacturers. Yet, unlike so many generalities, it is very largely true. There are exceptions, of course, but they prove the rule. Paint is and should be a still more important factor in lengthening the life of metallic structures and of wood. There are certain seasons of the year when the painting can be done under more favorable conditions than during other times of the year. Some remarks on painting should be of value at this time, therefore.

On account of the heavy investment around the paper and pulp plants in construction, painting, assumes an added significance. Unfortunately, in many instances the purchaser of supplies will buy the cheapest paint, buying upon price. The paint to buy is the paint that will last the longest for the service that is required of it and the conditions that it must meet. The total cost of painting is, of course, the cost of the paint, the cost of applying it, as well as the cost of insurance and accident protection of the men doing the work. In the majority of paper and pulp plants, painting is done by men who are on the pay-roll in any case, so that the labor cost looms smaller than is usually the case, hence the choice of a good paint becomes more important than ever. Robert Job brought out some important facts about painting structures in his paper entitled "Paint Failure Diagnosis," presented before the American Society for Testing Materials at Atlantic City, June 23-27, this year.

"With inferior materials—either pigment or vehicle—short and unsatisfactory protection naturally would be expected, and the characteristic appearance would generally be evident. Materials of excellent quality but not adapted or intended for that type of service would also fail and the cause could be determined by analysis or by the physical condition of the film.

Now and then an inferior non-drying oil is used in the vehicle, and in the less exposed positions the film may remain in a sticky, dust-catching condition for a considerable time, though in neighboring, more exposed positions, the breaking down of the film may be very marked.

Fortunately each type of failure has its own characteristic appearance which tells its own story and so serves to indicate the cause. Consequently, there is nothing mysterious in the diagnosis of a paint failure.

The short life of paint may be traced to any of these possible causes:

1. Failure to properly prepare the surface for painting. This would include painting over loosely adhering mill scale, rust, blisters, grease, etc., or painting over a damp or wet surface.
2. Improper application of the paint. This heading would include:
   (a) Failure to stir the paint and to keep it stirred so as to get good uniform consistency, and
   (b) Failure to apply a good, even, well-brushed coating.
3. Bad paint, by which is meant paint either of inferior quality or of a composition designed and suitable for use under other conditions of service and not possessing the resistance to weather essential in a good paint for the purpose used.
4. Special unfavorable conditions.

With the conditions which resulted in the failure definitely established, it should be possible to fix upon the proper remedy. This might involve entire rearrangement of the methods for preparation of the surface prior to the application of the first coat of paint. Or the number of coatings or the composition might require change. In still another case, methods for the careful supervision of the work of the painting may be found essential. In any event, once the real underlying causes are fully established, half of the problem is solved.

To obtain the best results from paint, it is necessary to tell the paint manufacturer what sort of surfaces and what conditions of weather, temperature, heat, etc., the paint must meet. Even with the correct paint, a job may not be satisfactory unless the men who do the job are properly instructed and properly supervised. This is a task for someone who is familiar with paints and their application. Moreover, it is not enough for him to show up when the job is starting. The success of painting is determined at the time the surfaces are cleaned preparatory to the painting. Important structures deserve good paint and careful painting.

To Store Bituminous Coal Safely

THE following simple precautions will do much to prevent fires in piles of soft or bituminous coal:

1. Piles should not be over 12 ft. deep and no part of the interior more than 10 ft. from the surface, although these figures may be frequently exceeded where the grade of coal and precautions in handling permit.
2. Store only screened coal if possible.
3. Keep out dust as much as possible; avoid handling and rehandling.
4. Distribute lumps and fines as evenly as possible. In other words, do not allow lumps to roll to the bottom to form air passages.
5. If at all possible, rehandle screenings every two months.
6. Allow six weeks' seasoning after mining before putting coal in storage.
7. Avoid alternate wetting and drying.
8. If coal is received wet, dump into small piles around the edge of the major pile so that air can get to it freely to carry away moisture.
9. Do not store in contact with brickwork, timbers or other obstructions that will permit the entry of air beneath pile.

There are two ways of preventing a coal pile from heating and catching fire. One is to have a thorough ventilation through it by means of ample air; the other is to exclude air altogether. This latter is the safer and more practical method in most instances.

Weed Control on Reservoir Margins

THE report of the Board of Water and Power Commissioners of Los Angeles, California, for the fiscal year ended June 30, 1929, explains how all reservoirs in the San Fernando Valley District are now under complete weed control. To accomplish this, 300,000 gallons of fuel oil were used during the last fiscal year. This oil was applied as a mixture of one-third oil and two-thirds water. The mixture was sprayed under pressure on all weed growths which made themselves evident above the high-water line of the reservoir and over the reservoir bottoms as the water receded. This treatment has been in effect two years now, and resulted in getting a 98 per cent kill of all weed growths, tulles and willows. The method has resulted in material savings from a maintenance standpoint, in connection with the sanitary control on the margin of these lakes, with the added advantage that it gives the property a neat and pleasing appearance.

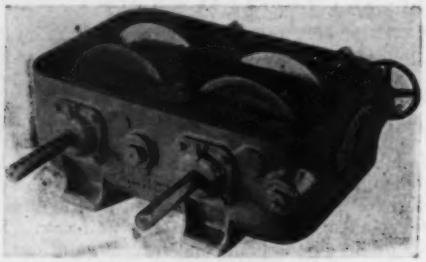
The man who falls down, gets up quicker than the man who lies down.

An executive is measured by the men he builds.

A New Transmission

The Lewellen Manufacturing Company announces its new One Hundred Series Lewellen Transmission.

This new design is equipped complete with ball bearings and is totally enclosed. The interior mechanism follows the



principle of operation of the present Lewellen transmission, and the new series is a departure from other drives in several respects.

The enclosure is water and dust tight. This protection is adequate for moist and abrasive conditions.

Access to the interior is had by removing the cover. Pressure lubrication throughout. Compactness is obtained in

the new design. The space occupied is approximately one half that of the usual type of drives.

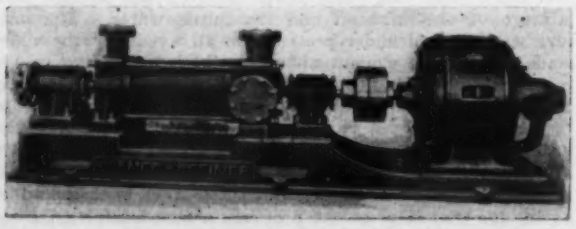
Accident hazard is eliminated while 50 per cent increase in power along with reduced wear and tear on the unit, is obtained.

This new series is available with drive motor support, remote control and other appliances. It may be supplied in regular speed ranges, and may be run in either direction, mounted in any position, and either shaft may function as the variable or constant speed shaft.

The Wiener Pulp Refiner

The Wiener pulp refiner has been designed, according to statements of the manufacturer, to handle the most difficult stock. This stock can be handled directly from the digesters, grinders, shredders, or other pulp disintegrating equipment.

The general appearance of the machine may be obtained



by studying the accompanying illustration. As may be noted from a study of the illustration, the machine has been built with the idea of ruggedness and simplicity. The plug and shell may be made of cast iron, cast steel or bronze depending upon the requirements of the machine when in service. When it is necessary, the plug and shell can be replaced easily and quickly. All moving parts are reduced to a minimum. Oversize S K F bearings are used. The machine is direct connected to an 1800 r.p.m. motor. In operation it is simply necessary to regulate the degree of refining by a turn on a handwheel.

John A. Wiener, 90 West 7th street, Oswego, N. Y., the inventor of the machine, will be pleased to supply complete information concerning the adaptability, uses, and construction of this machine to anyone who is interested.

S K F Develops New Type of Felt-Seal Ball Bearing

S K F Industries, Inc., has developed a new type of patented Felt-Seal Ball Bearing possessing a number of distinctive features which mark a radical improvement in this type of bearing. A felt seal is provided as an integral part of the bearing, thus making it necessary for the machine manufacturer to provide only one housing enclosure.

The outer and inner races as well as the balls in the S K F Felt-Seal Bearing are made of high carbon, chrome alloy steel hardened throughout. The bore and outside diameter are ground to international standard dimensions and tolerances, the same as the corresponding standard single row bearings. The width, however, is slightly greater than the standard dimension of a single row bearing in order to accommodate the felt seal. The tolerances on eccentricity of the outer and inner races are also international standard tolerances for single row ball bearings.

The inner race projects a little beyond the face of the seal in order that the bearing may be pulled off the shaft at any time without the possibility of damaging the seal plates.

The seal consists of an inner steel plate which is dished at its periphery and bears against a shoulder formed on the outer race. A removable felt of substantial size comes next, then a dished steel end plate, after which a split steel ring is fitted into a groove in the outer race to hold the assembly in place. An idea of the construction and the relation of the various parts can be gained by reference to the cross-sectional view of the S K F Felt-Seal Ball Bearing.

An outstanding feature of the design is the ease with which the seal may be disassembled at any time and new felts applied. To disassemble the seal, it is merely necessary to spring the split steel ring out of the groove in the outer race, after which all the other component parts of the seal may be readily lifted out. The entire procedure of disassembling and reassembling is a matter of a few minutes time.

The S K F Felt-Seal Bearing is made to the same high standard of quality that has become synonymous with all S K F marked products and offers outstanding advantages to the machine manufacturer. The bearing is available in sizes that are applicable to a wide range of small mechanical equipment, such as fractional horsepower and small motors, portable tools, and other light equipment.

Mr. Chapman Made Director of Research

Lukenweld, Inc., division of Lukens Steel Company, Coatesville, Pa., announces the appointment of Everett Chapman to the position of director of development and research. Mr. Chapman will have general direction of laboratory and investigation work in connection with redesigning of machinery parts for the welded steel type of construction.

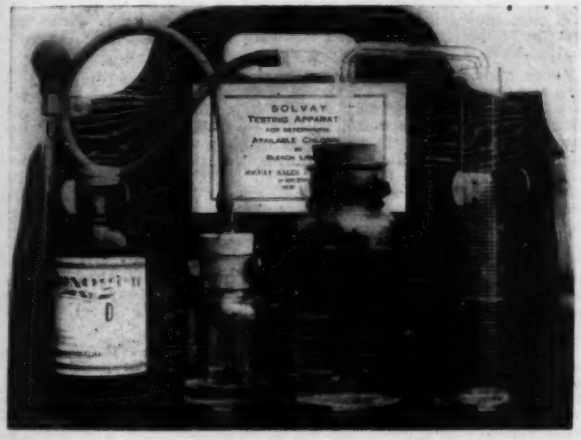
Mr. Chapman received his Master of Science degree from the University of Michigan in 1924. After a year at Purdue, he became director of research for the Lincoln Electric Company, of Cleveland, Ohio. In the course of this work he invented the electronic tornado welding process and carried out extensive research work in the metallurgy of welding. His recent studies have been along the lines of determining the most economical methods of using material in welded steel structure.

A Handy Device for Testing Bleach Liquor

The term bleach liquor as ordinarily used in the pulp and paper mill means a water solution of calcium hypochlorite. It is obtained either by the action of chlorine on milk of lime or by the dissolution of bleaching powder in water.

Under suitable conditions, the calcium hypochlorite gives up its oxygen in the nascent form in the presence of substances that can be oxidized. Fortunately, the bleach acts first on the lignins and coloring matter; but if there is much bleach left after the easily oxidizable substances are destroyed, its action on the cellulose itself may be severe. On the other hand, it is practically impossible to get a white pulp without using a slight excess of bleach. Only by careful control of the entire bleaching operation can the best results be obtained.

There are in use various methods for the preparation of bleach liquor, but all methods are subject to more or less



variation from time to time in strength of the finished liquor. It is for this reason that the careful bleacher makes sure of the strength of his bleach before he uses it.

Realizing the need for a reliable routine method for testing bleach liquors, chemists connected with the laboratories of The Solvay Process Company set about to develop a simple method for making these tests which could be easily learned and used by anybody. The result is a very neat little device which determines the "available chlorine" (oxidizing) strength of the bleach liquor by measuring the volume of oxygen evolved in a reaction between the hypochlorite and hydrogen peroxide. The only reagent used in making the test is ordinary household hydrogen peroxide which may be purchased at the corner drug store.

The apparatus is so designed that the liberated oxygen is measured by the displaced water in an ordinary graduated cylinder and the strength of the bleach in terms of "available chlorine" is found by merely noting the quantity of water in the cylinder. Only about 10 cubic centimeters of hydrogen peroxide are used to make the test, and less than two minutes are required for the complete operation.

The Bleach Testing Outfit is fitted into a well finished rack and comes complete with instruction cards and a convenient carrying case. The outfits are furnished by the maker at cost. Anyone who is interested may obtain further details from Solvay representatives, or direct from the main office of Solvay Sales Corporation at 40 Rector street, New York City.

Owing to the sudden death of its president, Shelton A. Hibbs, on July 14, the board of directors of The Moore & White Company, Philadelphia, held a special meeting July 18, at which the following officers were elected: J. Atwood White, Sr., president; J. Atwood White, Jr., assistant to president; James A. Currens, treasurer; Charles H. Prenzel, secretary and assistant treasurer. The other officers and directorate remain unchanged.

Midwest and Fulton Companies Merge

An announcement of real interest to the paper industry is the recent merger between The Midwest Machine Co., of Dayton, Ohio, and The Fulton Engineering Co., Inc., of Middletown, Ohio.

The new company will operate under the name of the Midwest-Fulton Machine Company, with offices and plant at Dayton, Ohio.

Both companies are well known to the paper industry, and for some years have been successful in maintaining their respective positions of leadership in their chosen fields. By combining their efforts, the new company will be greatly strengthened, and the field of service considerably enlarged.

The Midwest Machine Co. for some years has been engaged in the manufacture of its Midwest Hi-Speed beater, various types of continuous beating systems and other important processes involving stuff preparation. Its efforts have been signally successful and its products are in general use throughout the industry.

The Fulton Engineering Co. has enjoyed the same favorable standing in the paper industry, notably by reason of the development of the Fulton Forced Vapor Circulating System. This highly successful system is in operation on many paper machines in this country, as well as in many foreign countries, such as Japan, Russia, Great Britain, Germany, Norway, Sweden, France, etc., where its systems are fully covered by foreign patents.

The new Midwest-Fulton Machine Co., will be operated by the following officials:

Nelson S. Talbott, president; William V. Knoll, vice-pres. and gen. mgr.; W. B. Fulton, vice-pres.; Logan R. Herbert, treasurer; Murray Smith, secretary; W. Victor Phenice, chief engineer; G. H. Young, sales manager; Frank L. Shonkwiler, sales engineer.

The long experience in paper mill problems which serves as a background for the new organization is a definite assurance that the paper industry will be adequately and profitably served during the coming years.

With the merger an accomplished fact, the Midwest-Fulton Machine Co. is now in a position to put into effect, even broader policies of service, and enlarged facilities for the development of new processes while constantly maintaining or improving the rigid standards of quality for which Midwest equipment and Fulton Systems have been so favorably regarded in the past.

Mill Supply Industry Launches Campaign

A proposed advertising and merchandising campaign designed to sell industry on the economic importance of the industrial distributor is being worked out in the mill supply industry.

A committee was set up at the triple convention of The National Supply and Machinery Distributors; Southern Supply and Machinery Distributors, and American Supply and Machinery Manufacturers Association at Memphis early in April to get the program started.

The plan, which calls for the gathering of the facts relating to the distribution of industrial supplies and equipment and the dissemination of these facts to industrial users, manufacturers, and distributors, was fully outlined in the report, "Your Committee Recommends," mailed recently to 3300 distributors and manufacturers.

A great deal of headway is being made, as is evidenced in the fact that more than 120 organizations have already subscribed approximately $14,000 a year for three years toward putting the program into effect. Additional subscriptions are coming in daily.

At the last meeting of the committee the industry slogan, "Distributors Serve Industry Economically," was adopted. Distributors and manufacturers are to carry this slogan to industry on their advertising pages and in their sales promotion material.

The committee, known as the Joint Merchandising Committee of the Mill Supply Business, is made up of the following men: R. W. Procter, The Black and Decker Manufacturing Co., Cleveland, chairman; R. M. Gattshall, The Republic Rub-

ber Co., Youngstown, Ohio; D. W. McAllen, S.K.F. Industries Inc., New York; C. A. Channon, Great Lakes Supply Co., Chicago; L. G. Puchta, The Queen City Supply Co., Cincinnati; J. L. Pitts, Brown-Roberts Hardware and Supply Co., Alexandria, La.; F. M. Archer, Superior Supply Co., Bluefield, W. Va.; H. R. Ireland, Industrial Supply Co., Terre Haute, Ind.; F. J. Hofacker, Evansville Supply Co., Evansville, Ind.; R. K. Hanson, American Supply and Machinery Manufacturers' Ass'n, Pittsburgh, secretary; and A. E. Paxton, editor, Mill Supplies, advisory member.

Dayton Rubber Wins Infringement Suit

The laminated, die-cut, raw-edged V-belt of the Dayton Rubber Manufacturing Company, Dayton, Ohio, is a new structure and the basic patent covering it is valid, according to a decision recently handed down by the United States Court at Columbus, Ohio, in a suit directed by the Dayton concern against a distributor and manufacturer of infringing belts.

Used as original equipment on more than 85 per cent of all makes of automobiles, the V-shaped rubber and fabric belts of the Dayton company are also found extensively in the drive systems of various types of domestic refrigeration machines, on washing machines, on pumps and other nationally used products. They are also used in practically every branch of industry on drives ranging from a fraction of a horsepower to several hundred horsepower.

New Catalogues, Books and Publications

Combustion Engineering Corp., New York City—This company has just issued the first catalogue describing its fin-tube economizer. Among the important features claimed for this economizer are: the arrangement of the finned U-tubes, making installation possible where space is very limited; fewer return bend joints; high rate of heat transfer; low water pressure drop and ease of accessibility for cleaning and inspection. The advantages and details of construction are outlined, accompanied by a number of figures and installations that have been made. Copies on request.

Gould's Pumps, Inc., Seneca Falls, N. Y.—The second series of centrifugal pump selection chart bulletins is being distributed by this company. This book covers multistage pumps for capacities up to 2,000 g.p.m. and heads up to 2,400 ft. As with the first book, a comprehensive group of charts enables the prospective pump user to quickly and easily determine just what pump is best suited to his individual requirements. Copies upon request.

Leeds & Northrup Company, Philadelphia, Pa.—The most recent of the bulletins issued by this company is No. 880 descriptive of the L & N Relative Humidity Recorder, which is said to be a new departure in recording humidity. The usual psychrometric device measures the temperatures of wet and dry bulb thermometers in a current of air, but the observer must find the corresponding humidity from a table or chart showing the relationship. The unique feature of the instrument described in this bulletin is that it records relative humidity directly. The manner in which this is accomplished is explained and there is also a price list of humidity recording equipment. Copies upon request.

Moore & White Company, Philadelphia, Pa.—A booklet just published explains thoroughly the construction and function of this company's four-drum winders with collapsible winder shafts. The text is amplified by a large number of illustrations of winder parts also installations in many well-known mills.

A. C. Nielsen Company, 4450 Ravenswood Ave., Chicago—Nielson Survey No. 570, Roof Insulation in Paper Mill. Stops Condensation in Machine Room—An analysis of a common mill problem—excessive condensation over both ends of paper machine and rapid deterioration of wood roof. A concrete tile-roof with cork insulation substituted. Canopy no longer needed over dry end. A common condition wherever high room humidity prevails due to evaporation in open.

These surveys are ordinarily available only to Nielsen Survey index subscribers, but by special arrangement a complimentary copy will be sent to any user of such equipment who will write directly to the company asking for surveys by number and mentioning THE PAPER INDUSTRY.

Sullivan Machinery Co., Chicago—New publications just released by this company are: No. 87-C, Rotator Hammer Drills. This bulletin describes the new Sullivan L-8, 39-lb. rotator hammer drill for general rock excavation purposes in mines, quarries, and on construction work. Illustrations are shown of the rotator, its parts and the drill in action. There are also various tables giving data and details of operation. No. 87-E covers the S-2 Heavy Duty Stopper for mine service. Copies gratis.

Taylor Instrument Companies, Rochester, N. Y.—"Tycos Instruments" is the subject of a new catalogue just issued featuring instruments manufactured by this company with special application to the pulp and paper industry. The catalogue is very complete, covering not only temperature and pressure regulators, recorders and indicating instruments, but also pyrometers, level and vacuum gauges, hygrometers, and many other instruments very applicable to the paper industry. One of recent development and particular interest is the Tycos Recording Temperature Regulator for grinders, an application on which a patent has been applied for and which it is claimed solves the problem of controlling grinding temperatures to a very close degree.

Whiting Corporation, Harvey, Ill.—The Whiting No. 3 Unit Pulverizer is covered in a new bulletin No. 3. This pulverizer, equipped with the Whiting new high-low velocity burner (developed in connection with the pulverizer) is claimed to be especially adaptable to industrial furnace and small boiler firing.

BOOK REVIEWS

The Condensed Chemical Dictionary—The second edition of this valuable work has just been released, by the publisher, The Chemical Catalog Company, New York City. The first edition filled a great need in the field of industrial chemistry, over 16,000 copies having been sold. The second edition is more encyclopedic in form, giving fundamental information on a variety of raw materials and other products used in the chemical and allied industries. Certain items have been expanded in a semi-encyclopedic fashion offering a working knowledge of the fundamentals of the subject. Other new features include an expansion of the uses to which products may be put and an attempt to define common container sizes. Constants have been considerably expanded. The book is clearly printed on thin paper and alphabetically thumb-indexed. The price is $10.00.

Paper Makers Directory of All Nations—The 1930 edition of this directory has just been published, and will be of special interest to all who are in any way connected or have business relations with those in the paper and allied trades. The directory contains particulars regarding the paper, pulp and board mills of the world, such as location, production, number and width of machines, tonnage output, power used, etc., as well as lists of British wholesale stationers, paper merchants, waste paper merchants, rag merchants and paper stock dealers, china clay producers and merchants, and paper agents with the mills they represent. The mill productions are classified under 400 trade headings, alphabetically arranged as to products, countries and mills. The classified index to commercial prospectuses forms a valuable international buyers' guide. The directory contains 1,100 pages and is priced at 21/-net. Dean and Son, Limited, 29 King Street, Covent Garden, London, W. C. 2. are the publishers.

Verlag der Papier-Zeitung, Berlin, Germany—A dictionary of paper trade terms in three languages for the use of paper manufacturers and paper merchants is now available in a new edition, the publishers being Verlag der Papier-Zeitung, Carl Hofmann GmbH., Berlin SW 11, Germany. This comprises three handy-sized volumes as follows: AZ No. 2, terms for paper and board in English, French and German, together with special list of code words to enable importers to cable orders simultaneously from England to the United States, France and Germany or from any one country to the other two countries at a great saving in expense for cabling; AZ No. 6 is a dictionary of paper sizes divided according to countries and measurements in inches and centimeters, thirteen countries being listed, with trade descriptions of current sizes of paper in them; AZ No. 9 is a dictionary of price tables, containing the five price-systems most extensively used in international trade, as pence per lb., £ per ton, cents (U. S. currency) per lb., marks per 100 kg, and francs per 100 kg, with their corresponding equivalents. A single code word is used to designate the price and indicate its equivalent in three other languages, the equivalent prices being based upon the rates of exchange generally used in the trade. The respective volumes are sold as follows: AZ, $1.42, or 6 RM; AZ, 70 cents or 3 RM; AZ, $1.15, or 5 RM.

Wochenblatt Fuer Papierfabrikation—On the occasion of the annual convention in June of the German Association of Papermakers at Goslar, the **Wochenblatt fuer Papierfabrikation** issued a special Festnummer of 296 pages, of which 126 pages represent editorial text matter containing articles of scientific and historical interest, illustrated with ninety-six reproductions of photographs, drawings and charts. The articles include one on the English goldsmith and papermaker, John Spielman, with reproductions of the probable site of Spielman's mill on the River Darent, the monument to him in Dartford Church and the watermarks used by him; an account of the Darmstadt School of Papermaking; a description of the newer methods and machinery employed in the conveying and stacking of pulpwood; and a story of the paperboard and paper box industry in the United States. The **Wochenblatt** is published by Guentter-Staib Verlag, Biberach-Riss, Germany, and is priced at 3 Marks (72 cents).

Convention Number of the Papier-Fabrikant—To mark the annual convention of the German Association of Paper Manufacturers at Goslar on June 25, 26, and 27, 1930, our Berlin contemporary **Der Papier-Fabrikant**, has issued a special convention number of great interest containing 292 pages. The contributors represent some of the best-known writers among the scientists and practical workers of the German pulp and paper industry and the advertising pages are remarkable for the information given in them concerning sources of modern equipment and materials, lists of apparatus, materials and manufacturers being given in four languages—German, English, French and Spanish. The price of the convention number of the **Papier-Fabrikant** is 2.50 Reichmarks, of which the equivalent in American money is 60 cents. The address of the publication is Otto Elsner Verlagsgesellschaft M.b.H., Berlin S 42, Oranienstrasse, 140, Germany.

PACIFIC COAST

OREGON

Fir-Tex Plant Formally Opened

Formal opening of the $2,500,000 plant of the Fir-Tex Insulating Board Co., St. Helens, was held August 5 when A. E. Millington, vice-president and general manager, acted as host to citizens of the town, civic clubs and organizations from other centers who made special trips to view the huge new project.

The Portland chamber of commerce sponsored a large automobile caravan headed by the hospitality committee which left Portland in time to reach St. Helens for luncheon. Following this a two-hour tour of the plant was made under special guides.

Governor Norblad, Mayor Baker of Portland, the Oregon Congressional delegation and railway officials comprised the list of honor guests on this occasion.

This mammoth plant of Fir-Tex is the result of a development started less than five years ago in the minds of A. E. Millington and his son C. A. Millington. In 1926 these men had a vision of using the waste from Douglas fir sawmills for insulating board manufacture, believing that if this could be achieved an important milestone in forest products conservation would be reached. Their experiments for two years in California were successful and by 1928 the Millingtons were in a position to sell their idea to financiers of the Pacific northwest.

Incorporation papers were filed in May, 1928 in Oregon and offices opened in Portland for the conducting of the financial program which soon justified the building of the plant. Actual construction of the project got under way last September on a 175 acre site with 2,700 feet fronting on water connected with the Columbia river.

H. F. McCormick, head of the McCormick Lumber company and chairman of the board of St. Helens Pulp & Paper Co. is president of Fir-Tex Insulating Board Company; A E. Millington, vice-president and general manager; John S. Koke, secretary; Kenneth D. Dawson, treasurer; K. J. Carney, assistant secretary and assistant treasurer. C. A. Millington is general superintendent.

One of salient features of this plant is the close continuity of all production processes, the arrangement of units being in a straight line about half a mile in length. The dock is a quarter of a mile long with a pumping station at the end. The conveyor system for sawmill chips that arrive by way of the river is located along the dock and carries the chips to the storage digesters.

Following along the line of units are the stock preparation and storage rooms, the machine room, drying room, furnace room and shipping room. The boiler room and office laboratory in a separate group complete the lineup.

The plant has a capacity of 250,000 square feet of insulating board daily, the machine which turns out the board producing a sheet 12 feet wide and 7/16 of an inch thick when dried.

The Fir-Tex plant is purchasing its electric power from public utilities and oil is used for steam generation. Three 500 hp. boilers are used, with oil storage tanks adjacent.

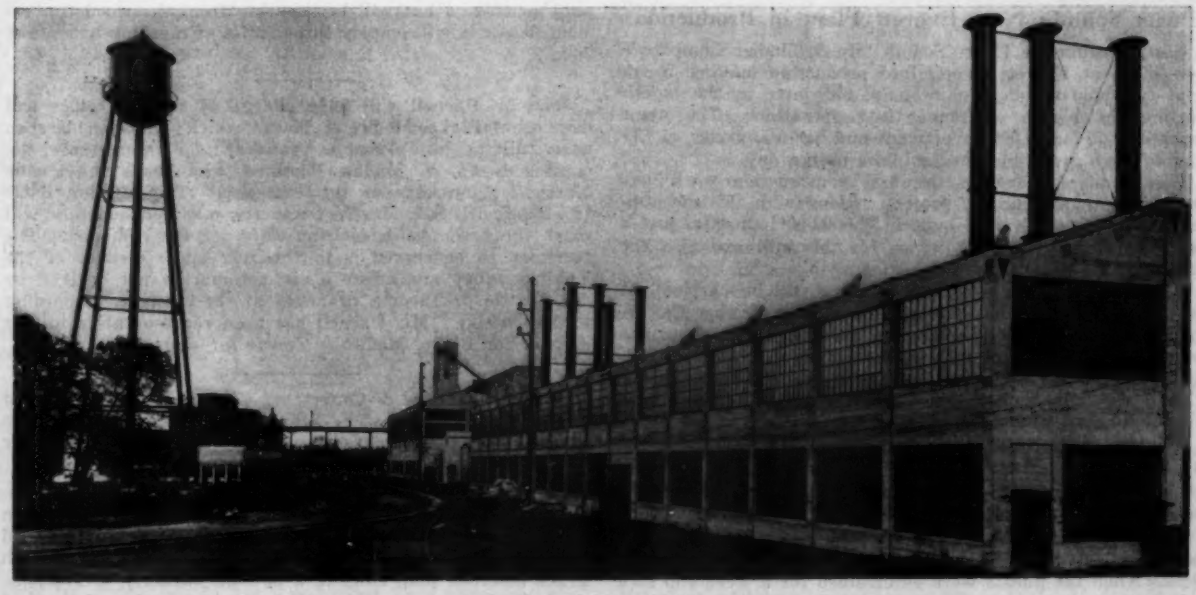
The plant has been made as nearly fireproof as modern science can achieve. Steel sliding fire doors wherever needed have been installed as a feature and an automatic fire protecting system of sprinkling is available.

So confident did the owners feel of the success of this initial project that provision was made for possible expansion when this seemed justified, to the extent of tripling the plant in size, without disturbing production.

Mr. Millington is well-known nationally from his connection at previous times with such prominent concerns as the Southern Paper Co., Moss Point, Miss.; Ontario Paper Co., Waterway Products Co., Chicago; Celotex Co., which makes insulating board from sugar cane, and the Spanish River Pulp & Paper Co.

Reports are current that if the Oregon Pulp & Paper Co., Salem, is not granted permission to acquire property adjacent to its present plant through the vacation of Trade street, the plant will be moved to Vancouver, Wash. This company recently asked this vacation and immediately were met with a remonstrance signed by certain groups in the city. It was planned to build a $60,000 addition to the mill on this property and if this is not possible the plant could not take care of necessary production in its Salem plant. To offset this remonstrance, employees of the paper company have been circulating petitions to provide for vacation of the street.

Members of the Pacific Coast section of T.A.P.P.I. are turning their thoughts to the second fall meeting of their organization which will be held in Portland early in October. It is hoped to have an eastern speaker on the program and although this matter is not yet settled according to officials,



View of plant of Fir-Tex Insulating Board Company, St. Helens, Oregon

the possibility is that B. W. Scribner, of the paper section of the Bureau of Standards, may address the meeting. A number of specialists on the west coast will also be on the program, leading discussions and presenting papers along their lines of study and experience.

F. C. DeWar, Ayr, Scotland, displayed much interest in the pulp and paper industry of the Pacific northwest during his recent stop in Portland on a world tour. He explained that he was a director in two large British corporations that contemplated turning their attention to the pulp and paper field in the future and he was alert to discover various phases of such activities in this part of the United States.

Clarence M. Packer, Portland, has sold his interest in the Packer-Scott Paper Co. in that city to his former partners Vernon Scott and Arthur Hosfeldt and is moving to Seattle where he has acquired control of the Seattle branch of the company. He will be president and manager of that division. Mr. Scott will be president of the Portland division of the company and Mr. Hosfeldt will be vice-president.

The Crown-Willamette Paper Co. put its newsprint machine at the West Linn plant on a five-day week schedule beginning July 14, this arrangement being announced as temporary and not to include grinders or other machinery.

St. Helens Pulp & Paper Co., St. Helens, has started production of bleached kraft. its output up to the present time having been dark kraft. This new paper is similar to Manila and has been trademarked "Kranila." An envelope paper of a light cream shade is also being made at this plant with success.

Hawley Pulp and Paper Co. has leased a building at East First and Salmon streets, Portland, which provides 30,000 square feet of warehouse space.

Wallowa Lime and Cement company a newly formed corporation which owns Marble mountain in Wallowa county. announced July 30 that a $3,000,000 plant will be built in Portland, which will manufacture among other things a stone for use in paper mills, in addition to cement, burned lime and nitrates.

WASHINGTON

Puget Sound's New Everett Plant in Production

Early in July the Puget Sound Pulp & Timber Company's new plant at Everett swung into production making in its trial run unbleached sulphite pulp, but later in the month putting the bleach equipment into operation. The plant represents a $4,000,000 investment and has a capacity of 175 tons of high grade bleached sulphite pulp a day.

Less than a year ago the first construction work was started on this mammoth project. Along with this development the city of Everett built a $2,000,000 industrial water supply system to provide water for this mill and also for other plants.

All operations for pulp manufacture will be carried out on the premises of the Puget Sound Pulp & Timber Co. A modern saw mill plant breaks up the logs fresh from the woods and sends them to the chipper plant where two 83-inch chippers prepare them for the digesters. There are five digesters 17x56 inches which were specially designed to permit of slow cooking.

The two fourdrinier drying machines were brought from Sweden and are 152-inch size. The buildings are so arranged that two more drying machines may be added when necessary without disturbing operation of the plant.

In celebration of the opening of the plant, Ossian Anderson, president, acted as host to construction engineers and all officials when the guests were entertained for a week-end at a popular mountain resort.

St. Regis to Build Plant in Seattle

Construction of a $250,000 paper conversion plant in Seattle is planned by St. Regis Paper Co. of New York, according to announcement made late in July by R. B. Maltby, vice-president of the organization, after a survey conducted in company with D. A. Fleishman, West Coast manager with offices in Los Angeles. The site will soon be selected and it is expected to have the plant in operation by fall.

This will be the third plant of the St. Regis Paper Co. on this coast, the other two being located in Tacoma and Los Angeles. About 150 persons will be employed. This plant will be designed to manufacture paper for heavy duty paper bags from pulp made in the Tacoma plant of the company purchased last year from the Union Bag and Paper company. Cement, sugar, flour and lime bags would comprise the output.

A later statement attributed to Mr. Maltby carries the news that a paper plant will be built at Tacoma in connection with the pulp plant there which will almost double the size of the investment there and which will also practically double the pay-roll. This would be constructed within six months at an expenditure of $2,000,000.

The last order of machinery for the new boxboard plant of the Longview Fiber Co., Longview, arrived in July on the Oregonian, an American-Hawaiian steamer. This was shipped from an Ohio factory and comprised six carloads. J. Clifford Page arrived from Brooklyn, Ohio, to oversee installation of the shipment. When the plant is opened eight persons will be employed.

Net earnings of the Grays Harbor Pulp & Paper Co. for the fiscal year ended April 30, 1930, after depreciation and allowance for federal taxes, available for bond interest requirements, were $542,611, equivalent to nearly two and a half times the total annual interest charges. The company operates a pulp mill at Hoquiam with a daily capacity of 150 tons of sulphite pulp and a paper mill having a daily capacity of 60 tons of bond paper. Earnings for the past fiscal year were derived from operation of the pulp mill for the entire period but include only operation of the paper mill for the last half of the year.

The Weyerhaeuser Timber Co. will start construction at Longview this fall on a 150-ton sulphite pulp mill, according to announcement made by A. L. Raught, manager of the company local office. The new mill will tie up with the company's holdings but will be separate from the wood conversion plant. It will employ three shifts of men totaling about 200.

John M. Darnell will have charge of the new office and division of Blake, Moffitt & Towne which will open as soon as a building in Yakima is remodeled for the purpose, according to O. W. Mielke, Portland, who heads the Pacific Northwest interests of the company. The location is at 107-109 South Second street and the new headquarters will mark the seventeenth division office for the company. The territory to be served is in the rich apple district of the Yakima valley and offers a distinct market not covered by the Seattle or Tacoma branches of the company, according to Mr. Mielke. Mr. Darnell has been representative in this district for Blake, Moffitt & Towne for eight years.

The Paper Board & Converting Co. has been incorporated in this state by Chas. F. Schaub, president of the Pacific Straw Paper & Board Co., Longview, and H. A. Hollopeter and F. B. Mitchell, of Portland.

Olympic Forest Products Mills at Port Angeles, which made the first production test in June is now well toward capacity operation, having already reached 125 tons of high grade bleached pulp daily in a possible capacity of 175 tons. A distinctive point in this mill is the installation of the first

Minton Vacuum Dryer on the west coast. This plant contracted for most of its output to the S. D. Warren company of Maine.

CALIFORNIA

C-Z Makes Report

Crown-Zellerbach corporation, for the second fiscal year of unified operation ended April 30, 1930, reports net income of $6,094,646, equivalent after preferred dividends of $1,512,962 and minority stockholders' interest totaling $1,720,329, to $1.43 a share on the 1,991,680 shares of common stock outstanding at the end of the period.

This compares with net income of $6,379,412 earned in the fiscal year ended April 30, 1929, equal after preferred dividends and minority stockholders' interest to $1.72 per share on the 1,991,680 outstanding common shares. Adjusted earnings for 1928 amounted to $1.55 on the same basis.

Profit before depreciation, depletion, interest and taxes, amounted to $12,366,689 for the fiscal year ended April 30, 1930, an increase of $316,696 over the $12,049,993 for the preceding period. Deductions for depreciation increased $640,219 and depletion $85,582.

Mason Olmsted of the Zellerbach Paper Co., has been appointed chairman of the mills relation committee of the Pacific States Paper Trade Association by President E. A. Doran. This committee was one decided upon as of possible value in the convention session of the association held in San Francisco this spring, and so important does its function seem to the president that he made his appointments on this committee ahead of others. Other members of the committee include H. S. Bonestell of the Bonestell Paper company; E. A. Doran of Blake, Moffitt & Towne; W. B. Reynolds, General Paper Co. and T. A. O'Keefe, Pacific Coast Paper Co.

Ross McPhee, for ten years sales manager in Los Angeles for the Zellerbach Paper company, has now opened offices at 541 Petroleum Securities building in that city where he will specialize in publication papers.

E. N. Smith, papermakers' representative, Los Angeles, has opened offices in San Francisco at 190 Lombard street under the management of Ralph Reid, recently district manager for the Graham Paper Co. in the Southern California district. The new office is for the purpose of serving more adequately the trade in Northern California. All lines of stock will be carried in a San Francisco warehouse. Edward N. Smith is located in the Insurance Exchange building, Los Angeles, and his lines include Rhinelander Paper Co., Tuttle Press, Crystal Tissue and Western Advance Bag & Paper Co., Inc.

Paper interests of the west coast will have representatives present to greet the International Association of Printing House Craftsmen which meets in Los Angeles August 16-21, some of whom are already working with Harry T. Watson, president of the Craftsmen, and his committees, making arrangements to show the visitors a fine time.

The Sunset McKee Salesbook Co., 2101 Livingston street, Oakland, will build a one-story addition to the present plant at a cost of $18,000. This new unit will provide for expansion in the company's manufacture of commercial paper.

Effective July 25; San Francisco stock exchange admitted to trading 200,000 shares additional of Crown-Zellerbach common. This represents stock necessary to take care of warrants attached to the 10-year debentures, and brings total listings to 2,980,000 shares.

The Pacific Coast Pulp & Paper Corp. which is sponsoring a rice straw project at Richvale, expects to have the plant ready for production of kraft and other fiber papers by the first of the year. D. M. Thompson of Santa Monica is president of the company which is capitalized for $500,000. Peter Swan of Portland is consulting engineer and vice-president; Wesley E. Martin of Sacramento is secretary.

A. L. Neumann, of the Los Angeles division of the Zellerbach Paper Co., is celebrating 43 years of service with this company by taking an extended trip through the Pacific northwest and Yellowstone National Park. He was with the San Francisco office for 26 years and 17 years in Los Angeles, and is the oldest employee of the company. He breaks another record also in having two sons connected with the same company.

MONTANA

G. A. Wakely, Seattle, appeared before the chamber of commerce of Great Falls in July and presented tentative plans for the establishment of a pulp and paper mill there by a company in which he is interested. Full details were to follow at a later date.

IDAHO

The Pacific States Pulp and Paper company which as previously reported plans a new 100-ton kraft mill for Priest River, has engaged R. L. Matthews, consulting engineer of Spokane, to direct some promotion work and also to supervise construction when that part of the program gets under way.

Embargo Lifted on Russian Pulpwood

Nation-wide interest has been taken in the temporary embargo laid on pulpwood from Soviet Russia by the Treasury Department of the United States government. The International Paper Company and the Racquette River Paper Company joined in protests against the embargo. Three shipments of spruce pulpwood consigned to the Amtorg Trading Corporation, the Soviet commercial agency in this country, for account of the paper manufacturing firms named, were held up for several days on the order of the Treasury Department forbidding the importation of Soviet pulpwood because of its alleged convict labor origin.

At a hearing in Washington on Friday, August 1, Seymour Lowman, Assistant Secretary of the Treasury, revoked the embargo order, because of conflicting and inconclusive evidence regarding the employment of convict labor in preparing the pulpwood for shipment. This will release about eighty cargoes which have arrived or are on the way to American ports.

George W. Sisson, Jr., president of the Racquette River Paper Company, and John H. Hinman, vice-president of the International Paper Company, testified at the hearing as to their contracts for Russian pulpwood drawn up last year and expressed conviction that convict labor was not used. Mr. Hinman averred that American paper mills of the International Paper Company were dependent on foreign pulpwood for the month's supply in advance and that it had three shiploads held up at New York, two at Portland, Me., and six at sea en route to the United States.

In a statement issued by the International Paper Company a few days in advance of the hearing, the position of the company with regard to Russian supplies of pulpwood was set forth as follows:

"Almost all paper mills in northeastern United States are obliged to import each year a substantial part of the pulpwood required for their operation. Heretofore, this wood has come from Canada, but recently Russian pulpwood has appeared in the market and in 1930 International Paper Company entered into a contract for the purchase from Russia of a part of its requirements for its mills in this district.

"While this Russian pulpwood is no cheaper than the Canadian pulpwood, it has the advantage of adding another source of supply of raw material for the operation of the United States mills. This pulpwood, substantially the only supply available for import other than Canadian pulpwood, thus gives additional assurance of life to the company's mills

in the United States and of employment to their men. The utilization of Russian pulpwood is in the interests of American workmen rather than competitive with them.

"Needless to say, in making its contract for pulpwood from Russia, International Paper Company had no intimation that convict labor was employed in its manufacture. On the contrary, the company received definite assurance that it was not, and in the absence of any knowledge of the information on which the Treasury Department has acted, the company remains in the belief that the pulpwood is entitled to admission to this country.

"It is particularly important that the United States newsprint industry be deprived of no proper supply of raw material. Newsprint is not protected by tariff, and United States newsprint mills and American workmen in newsprint mills must meet not only the competition of Canadian mills with their unlimited supply of this raw material but also the competition of European mills which are now drawing very heavily upon Russian supplies of pulpwood. In the last ten years, the output of the Canadian mills has risen from half to more than double the output of their United States competitors, while the output of the United States mills has been declining. From the point of view of the American workmen what is desirable is not the elimination of the Russian supply but rather assurances of its continuance."

In his argument against the embargo, George W. Sisson pointed out that the supply of spruce pulpwood from Canada was being depleted and contracts being exhausted. He said his company could not run a month longer without the supplies of Russian pulpwood which were being held up, the mills being dependent upon these shipments to fill a government printing office contract.

H. C. Evans of Alton Makes a Change

H. C. Evans, who for the past sixteen years has been general manager of the Alton Box Board & Paper Company, of Alton, Illinois, announces that he has severed his connection with that company and has become interested in and accepted the vice-presidency of the Cel-U-Del Corporation of Chicago.

The Cel-U-Del Corporation was recently organized to take over the business and manufacturing plant of the Harbaugh Process Company of Chicago, which has developed a new chemical product said to be of much value to the paper industry, invented by Dell F. Harbaugh. This had been introduced under the trade name "Cel-U-Del" and having become well-known, it was decided to make the corporate title correspond to the shorter trade name.

Mr. Evans states that for the past year he has been using Cel-U-Del at the Alton Plant with a very marked degree of success and has found it to be of great utility in the manufacture of boxboards and other grades of paper products.

Cel-U-Del was put on the market by the Harbaugh Process Company about eighteen months ago. Its utility has been found to be principally three fold,—as a chemical in the digester cooking of fibers, such as straw, flax, hemp and wood pulp; as a chemical used in the beaters to impart strength to finished sheets, also in conjunction with size to produce a waterproof sheet on such grades as kraft and other wrapping paper, bag stocks and the like; and as a chemical for waste paper conversion in the breaker beaters for the utilization of waste paper without the addition of strengthening raw pulps. It is also used in the manufacture of waterproof specialties and insulating papers, and for other purposes.

The Cel-U-Del Corporation is marketing its products under the trade names of "Cel-U-Del," for the strengthening of fiber pulps and the formation of tough sheets; "Cel-U-Cize," a sizing compound for waterproofing and finishing the sheet; and "Cel-U-Cook," for cooking of straw, woods and other pulp forming materials in the digesters.

The Foxboro Company, Foxboro, Mass., announces that J. B. McMahon who has been manager of its Tulsa branch. will hereafter have charge of field engineering service and direct sales effort, with headquarters at the home office. G. B. Lane, former Detroit manager succeeds Mr. McMahon.

❖ MICHIGAN ❖

Kalamazoo Valley Cost Association

About thirty-five assembled for the July meeting of the Kalamazoo Valley Cost Association at Watervliet the evening of the thirtieth.

Quite a number played golf in the afternoon thereby strengthening or reducing their position in the tournament being conducted this year among the members. The finals are to be played in September.

After a sumptuous dinner which left everyone with that satisfied expression, President Whittington called for order and after a few announcements introduced the president of the new village of Parchment which has grown up around the mills of the Kalamazoo Vegetable Parchment Co. and has just recently been incorporated as a village. Mr. Frank Libby, the village's first president is an honored member of the Cost Association and answered to the introduction with one of his well-known smiles and a gracious bow. The second introduction was of the new village's treasurer, Ernie Turner, another member of the Cost Association.

Preliminary business being completed, the first speaker of the evening, E. J. Turner, was given the floor and did a very good job discussing "Present Business Conditions." Mr. Turner based his talk on a number of papers which had been presented recently at the Chicago meeting of the National Association of Purchasing Agents, also on business charts which are published weekly.

It was very interesting to hear some of the prophecies which were made over a year ago regarding present business conditions, and it is also very gratifying to learn that some businesses are doing a greater volume of business this year than they did in 1929. Several industries are showing greater profits than they did a year ago, and others are showing greater actual sales but not so good profits.

The general feeling among the men as voiced by Mr. Turner, seems to be that we are now headed toward better conditions generally and as sales increase it should be possible to better the margin of profit and eliminate the "below-cost" type of selling.

Following Mr. Turner's paper, there was a short discussion but the subject had been so thoroughly covered that little of importance could be added.

The second speaker on the program was H. S. Farum of the Watervliet Paper Co., whose subject had been assigned as "Coating Mill Problems," but as Mr. Farum stated, "they are legion" and the discussion could last all night; therefore, he took up one phase or one problem which his mill has been studying quite thoroughly, that of "Drying."

Mr. Farum described quite carefully the present method they are using and the various alterations they had made in their coating department to accomplish the maximum in drying efficiency and to prevent operations on one machine from affecting that of another. Each drying loft is tightly partitioned from the next and in place of the steam coils a hot air blast is used.

Questions came thick and fast upon the finish of Mr. Farum's talk, among them being the uniformity of drying as compared to coil drying. The speaker's answer was that the hot air seems to give a much more uniform sheet although the system has not been in use long enough for them to have obtained definite figures to prove this.

Before closing the meeting, every one present gave Mr. Farum and Mr. Ferguson a rising vote of thanks; the former for the excellent dinner arrangement, and the latter for his generosity in providing for the green fees for those who played golf in the afternoon.

Foote Bros. Gear & Machine Co., Chicago, announce that E. C. Wilson formerly in charge of the pricing group of the gear and reducer division of the company, has been appointed assistant sales manager. Mr. Wilson was until 1929 assistant sales manager of the R. D. Nuttall Co., Pittsburgh.

The Month at Washington

FEDERAL Trade Rulings—Under a recent ruling of the Federal Trade Commission (Stipulation No. 558), a corporation selling paraffin paper containers will no longer misrepresent itself as a manufacturer so as to imply that it owns, operates, or controls a mill in which are made the products it sells, when such is not the fact.

Under Stipulation No. 545 a corporation jobber of paper will discontinue using certain expressions to describe its products so as to imply that it has a rupture strength capable of withstanding a test of not less than 150 pounds to the square inch, or that such product has the qualifications of tensile strength and weight specified by rulings of the Interstate Commerce Commission and the regulations of the trade.

Interstate Commerce Rulings—Proposed cancellation of commodity rates on paper, pulpboard, and woodpulp, dishes, plates, and trays of paper, in carloads, from, to, and between points in southern territory were found justified in a recent ruling of the Interstate Commerce Commission (I & S Docket No. 3405), and the order of suspension was vacated and the proceeding discontinued.

Census of Manufactures—The Government Printing Office has just released the "Census of Manufactures" as a bound publication, being a summary by industry groups and by industries, and showing as Group 4, paper and paper products, from 1921 to 1927, showing total number of establishments, wage earners, wages, cost of materials, supplies, fuel and power; value of products, horsepower, etc.

New Tariff Revives Business—Many business enterprises have resumed operations, with resulting augmented labor employment, and there is a confidence in the tone of business, indicating renewed activity since the new tariff law was enacted, says Congressman Hawley, chairman of the Committee on Ways and Means of the House, which framed the bill. The tariff act has been a law for only two months, but from numerous reports coming in many businesses which were either working on part time or closed down, have reported resumption of business and re-employment of labor, due to the ending of a long period of uncertainty as to what the tariff bill might be and the advantage given to American enterprises by the new rates.

Employment and Pay-rolls—The Bureau of Labor Statistics reports a decrease in employment of 1.8 per cent and a decrease in earnings of 2.7 per cent in July as compared with June. With 1926 as the basis of 100, we find the following changes for

	Employment			Pay-roll totals		
	1929	1930		1929	1930	
	July	June	July	July	June	July
Paper and pulp	95.7	94.6	93.8	97.7	96.1	94.1
Paper boxes	93.2	87.8	88.0	99.7	90.9	92.1
Paper and printing 100.2		99.6	98.6	105.2	104.9	103.6

Correct Your Mailing List—Hundreds of thousands of dollars are wasted each year by direct-mail advertisers using obsolete mailing lists, combined with the failure of advertisers to use return cards on envelopes, says the Post Office Department. It is estimated that advertising matter furnishes more than 50 per cent of all dead letters handled each year. Last year more than ten million letters containing circulars and advertising matter, were disposed of as waste by the dead letter service. The use of envelopes without return address makes it impossible to return many pieces. The use of return address secures the return of nondeliverable letters, sent under first-class postage, and for which there is no charge. This would enable the mailer to know at once how many of his circulars had been delivered and would eliminate from his mailing list the incorrect addresses, thereby avoiding further waste of material, postage and labor in subsequent mailings. Blank envelopes do not excite any more curiosity than those bearing return addresses, it is pointed out, and the folly of sending them should be apparent to every one.

In an effort to assist business concerns in getting the fullest measure of service from their letters and circulars, the Post Office Department has authorized postmasters to correct mailing lists on a fixed charge of 65c an hour (the rate of pay for a substitute clerk).

New Postal Convention with Cuba—A parcel post convention has been signed between the United States and Cuba, effective September 1. This now gives a reciprocal relation between this country and all Latin American countries.

Unaddressed Advertising Mail Matter—The Postmaster General has frowned upon the suggestion that unaddressed advertising matter be handled for delivery by carriers. While this subject has been before the Department a great many times, it only recently was pushed very strongly. Under the proposed scheme the post master would furnish advertisers with the number of post office box holders, the numbers of different city letter carrier routes, and the number of stops on each route which would enable the advertiser to make up his advertising matter in packages labelled to the box sections or route numbers, such mail not to be addressed in any manner whatsoever. One piece would then be delivered in each post office box and delivered at each stop on all carriers' routes. "While there may be some advantages to the plan," says Mr. Brown, "the disadvantageous features of the procedure are such as to make its adoption impracticable and inexpedient."

World Market for Paper—The Chief of the Paper Division of the Department of Commerce points out that the world market for paper is growing, with the United States and Canada leading in production of wood pulp. The division is now working on a polyglot glossary of paper descriptive terms to be used as a common ground for classification of papers in international trade.

It is pointed out that the ten main classifications of paper in common use in industry are

(1) absorbent papers, including blotting, filter and toweling;
(2) boards, including chip, jute, news, wall, insulating and straw;
(3) building, including all felts and sheathing;
(4) fine cardboards, including all bristols;
(5) cover, both coated and uncoated;
(6) newsprint, including hanging stock;
(7) book printing, including both coated and uncoated book, india, Bible and mimeograph;
(8) tissue, including copying, stereotype, condenser and cigarette;
(9) wrapping, including kraft, bogus, manila, glassine, vegetable, parchment, sulphite and straw;
(10) writing, including bonds, drawing, manifold, tracing, and sensitizing stock.

Value of Census of Manufactures—The Census of Manufactures supplies the most comprehensive and reliable statistical information available on industrial America, says the Census Bureau. Private surveys must of necessity be of a sampling nature. And so this year improvements in the tabulations are being made and every suggestion received from business men is being carefully considered.

Recently officials of the Census Bureau conducted a sym-

posium among the manufacturing associations in an effort to ascertain general uses of the manufactures census figures, and the result showed that the census had a stabilizing effect on industry. They were used in forecasting trends and production, recording industrial progress, checking conditions in industry, comparing industries and studying distribution.

Employment Situation—With the appointment of an advisory group on employment by President Hoover as a means of co-operation with business and the measurement of actual business conditions in the employment field, a new step has been taken to stabilize another disconcerting factor in our economic business life. The committee is to advise on methods for revising the government's statistical services for the determination of unemployment and to establish the method of co-operation between government departments and business.

Employment is generally a barometer of business conditions and the objective sought is to establish local agencies as well as government agencies who will co-operate in a constructive relief of unemployment instead of the haphazard methods which have prevailed in the past. The need for more systematic information has also been generally endorsed by business and labor organizations for some years. The question is not a simple one.

Paper Notes of Interest—Canadian mills during the first six months of this year produced 1,283,922 tons of newsprint paper as against 1,311,322 tons last year.

The Scandinavian pulp and paper markets still continue in a dull mood. In sulphite pulp the strong unbleached varieties were the only ones in demand. Some sales of strong sulphate (kraft) pulp were made but only at extremely low prices.

The British paper market still seems affected by the general depression, while the French paper industry is marked by declining orders.

A new company has been organized in Chile to manufacture printing paper capitalized at close to a million dollars. The new mill will be located in the Valdivia region, which is the center of Chile's timbered area.

A market for envelopes is indicated in Sumatra, Netherlands, East Indies, and a market for kraft paper in Mexico, according to the Bureau of Foreign and Domestic Commerce. Portuguese East Africa is also pointed out as offering possibilities as a market for insulating paper or boards. Crepe paper towels and paper dusting pads are wanted in Hamburg, Germany (44618), vulcanized fiber also (46613), and chemical pulp and other raw materials for paper mills in Milan, Italy (46614).

Heat and Ventilation for Working Efficiency—Scientific tests carried on by the Public Health Service and the Bureau of Mines reveal that heat affects the efficiency of workers and that ventilation plays a most important part in relation to labor and safety. Atmospheric conditions, such as temperature, humidity and air movement, under which persons work and live, have a notable effect on their efficiency, health and comfort, it is pointed out, and that abnormal physical conditions of the air sometimes have serious results. Increased comfort means increased efficiency on the part of workers, which means increased output and consequently a greater financial return to be obtained through proper ventilation of working places. Output or work done is greater when the air is moving than when it is standing still or stagnant.

W. W. Patrick

Mr. W. W. Patrick, a director of the Foxboro Company died suddenly, July 11. He was one of the most widely known figures in the instrument business and had been associated with the founders of The Foxboro Company since 1899. In 1908, he became New York District Sales Manager and held that post for twenty-two years.

Mr. Patrick was also a prominent figure in the Association of Scientific Apparatus Makers of America. He was a director of the Association and Chairman of the Industrial Instrument section.

Dr. Baker Elected Dean of Forestry College

Hugh Potter Baker has been elected Dean of the New York State College of Forestry, Syracuse University, by the Board of Trustees to succeed the late Franklin F. Moon. Dr. Baker's name was presented to the Board by a special committee headed by Chancellor Charles W. Flint, of Syracuse University. The committee composed of the Chancellor, Frank P. Graves, Commissioner of Education; Edmund H. Lewis, Justice of the Supreme Court, and William H. Kelley, of Syracuse, after canvassing the forestry educational field thoroughly, submitted the qualifications of the various candidates.

Dr. Baker has until the present been manager of the Trade Association Department of the United States Chamber of Commerce, Washington, D. C. Dr. Baker was the first Dean of the College, having served from 1912 to 1920. He laid the foundations of the present institution and its subsidiaries, the Ranger School at Wanakena, and the Sophomore Summer Camp at Cranberry Lake, as well as several of the experimental forests that now belong to the college. This pioneer work involved innovations and advances in the educational field beyond the standards that had been set in the profession and proved prophetic of future development in forestry.

Dr. Baker became the executive secretary of the American Paper and Pulp Association in 1920. Eight years later he associated himself with the Chamber of Commerce of the United States where he has been engaged since that time.

Dr. Baker received his Bachelor of Science degree, Michigan State College, 1901; Master of Forestry, Yale, 1904; Doctor of Economics, University of Munich, 1910. He served ten years with the U. S. Forest Service. Before coming to Syracuse he was professor of forestry in Iowa State College, 1904-07, and Pennsylvania State College 1907-12. He is a Fellow of the American Association for the Advancement of Science, Royal Geographic Society of London, American Geographic Society, Society of American Foresters and Society of Colonial Wars, Sons of American Revolution and Loyal Legion. He was a member of the second R.O.T.C. at Fort Sheridan, Ill., 1917, served with the 46th Infantry as a member of the general staff and is Major of the Officers Reserve Corps.

◆ NEW YORK CITY ◆

Sigmund Goldman

Sigmund Goldman, a well-known and highly esteemed figure in New York pulp and paper circles passed on last month. After an illness of three months from sleeping sickness, he lapsed into unconsciousness at his home, 910 West End avenue, New York, early on Saturday morning, July 26. Funeral services were held on Monday, July 28, and were largely attended by his friends and many of his business associates, for Sigmund Goldman had endeared himself to all who enjoyed the intimacy of his acquaintance and he will be sorely missed. He was in the sixty-third year of his age, having been born in California, March 29, 1868.

The English China Clays Sales Corporation, of 551 Fifth avenue, New York, of which the late Mr. Goldman had been the respected president for the ten years of its existence, sent out a general notice of his demise in which the deepest sorrow was expressed by his associates, A. H. Holbrook and H. M. Gillespie.

Mr. Goldman had been identified with the Association of American Wood Pulp Importers ever since its foundation, having been one of its founders, and its first secretary. He originated the testing committee of the association and served as chairman of it up to the time of his death. When he retired from the wood pulp importing business, consequent on the formation of the English China Clay Sales Corporation, he was elected an honorary member of the Association of American Wood Pulp Importers.

Mr. Goldman came to New York from Monroe, Mich., where he received his early education and training, some forty years ago. His first connection was with A. Wertheim,

ADVERTISING PAGES REMOVED

a German wood pulp exporter, who had just established an office in New York, and was subsequently for ten years with the firm of Atterbury Bros. He then was appointed manager of the wood pulp department of Perkins-Goodwin Company which at that time was the United States sales agency for a group of English china clay producers. The English clay miners desired to establish an American branch of their own and effected an amicable arrangement to this end with the Perkins-Goodwin Company, the chief stipulation being that Sigmund Goldman become directing head and president of the English China Clays Sales Corporation which was formed. Notwithstanding the severance of his relations with the wood pulp importers, Mr. Goldman was frequently called upon to arbitrate disputes concerning the quality of imports and he was continued from year to year as the chairman of the Testing Committee of the Association of American Wood Pulp Importers.

Mr. Goldman is survived by his wife, a son, Louis, and two daughters, Mrs. Herbert Weinshenck, and Miss Nanon Goldman.

Receiver for Cornstalks Co.

Upon the petition of Elton Darling, a stockholder, and upon the consent of the debtor corporation, Judge Goddard in the United States Court for the Southern District of New York on July 10 appointed F. E. Butcher, of Danville, Ill., ancillary receiver for the Cornstalks Products Company, Inc., of Danville, Ill.

The corporation is capitalized at over $4,000,000, and controls valuable patents and has expended more than $4,500,000 during recent years in making improvements and developing its business of manufacturing paper of cornstalk pulp. The receivership originated in the Federal Court in Illinois about two weeks prior to the appointment of the receiver by the Court at New York.

John F. Boyle, president of the boxboard manufacturing company bearing his name in Jersey City, N. J., was stricken fatally ill in his office at 500 Montgomery Street, Jersey City, on the morning of July 2, dying shortly afterward in his home in that city. Mr. Boyle had long been prominent in political circles in Jersey City, for many years treasurer of the Hudson County Democratic campaign committees, a Democratic leader of the County, and was formerly a member of the New York-New Jersey Tunnel Commission. Mr. Boyle for many years operated his boxboard mill on the shores of the Hudson River, virtually in the metropolitan section of New York, and was widely known throughout the paper manufacturing industry.

Knowlton Bros., owners of the Kamargo Mills in Watertown, N. Y., have opened a New York sales office in the new Chrysler Building, Forty-second street and Lexington avenue, where as eastern representative R. W. McCormick will make his headquarters.

C. B. Hewitt & Bro., Inc., paper merchants, are now comfortably situated in their new home at 23-25 Green street, New York, whence they recently moved from their former quarters on Ferry street where they had been located for many years.

Herman Grover, paper merchant, has removed from 451 Pearl street to larger and more convenient quarters at 230 William street, New York.

George Frederick Barton, one of the most widely known and highly respected salesmen in the paper industry, died at his residence in Brightwaters, Long Island, at the age of 69. Mr. Barton had been a member of the staff of Wilkinson Bros. & Co., of 419 Broome street, New York, for the past 28 years, and previously was with the Wilson & Towne Paper Company, and the Odell Manufacturing Company, of New York. He started his career in the industry as a millhand in the plant of the Seymour Paper Company in Windsor Locks, Conn. A widow, a daughter and a son survive.

Arthur Herman, formerly in the wood pulp department of the E. J. Keller Company, Inc., 200 Fifth avenue, New York, is now a member of the pulp sales staff of Parsons & Whittemore, Inc., of 10 East Fortieth street, New York, and will travel among the paper mills.

Harry W. Draudt, formerly with M. Gottesman & Co., Inc., wood pulp importers of 1440 Broadway, New York, has joined the pulp selling staff of Price & Pierce, Ltd., of 17 East Forty-second street, New York.

The Le-Royer Macfarlane Paper Company, of Boston, Mass., has established a New York City branch office at 370 Lexington avenue, at the southwest corner of Forty-first street.

The Allied Mill Supply Corporation is the name of a new concern just organized with offices in the new Chanin Building, 122 East Forty-second street, New York, to deal in papermakers supplies of all kinds and to specialize in rags and waste paper. Interested in the new company are H. C. Cohen, of Syracuse, N. Y., formerly with the Onondaga Trading Company in that city, and R. Palmieri, formerly in the mill supply department of M. M. Elish & Co., Inc., of New York.

The Reliance Paper and Twine Corporation, of New York, has increased its capital stock from 200 to 2,600 shares, of which 2,500 shares are preferred of $100 value each, and 100 are common shares of no par value.

◆ NORTHERN NEW YORK ◆

Williams Size & Service Corp.

Frank M. Williams, consulting chemist and chemical engineer of Watertown, has completed the incorporation of the Williams Size & Service Corp. at a capitalization of $500,000 with headquarters in Watertown. The main purpose of the corporation is to manufacture, sell and distribute sizing compositions for treatment of cellulose, textiles, etc. Capitalization is divided into 5,000 shares of common stock of a par value of $100. The duration of the charter is perpetual. Mr. Williams is to be the chief stockholder and with his wife, Mrs. Adda B. Williams, his son, Dexter B. Williams, and his sons-in-law, Parker Harrison of Cambridge, Mass., and Harrison Shaler of New York city will make up the directorate.

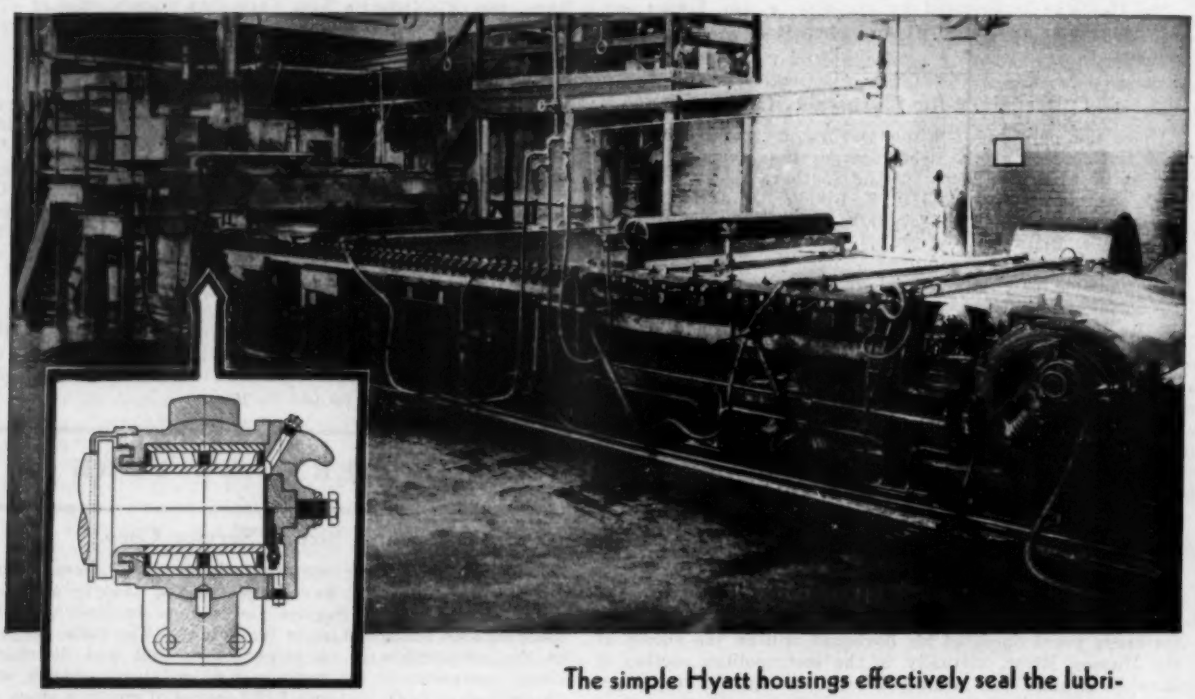
For many years Mr. Williams, formerly a member of the faculty of Clarkson College of Technology at Potsdam, has been closely identified with the chemical side of pulp and paper manufacture, and has been called into consultation by many companies in this country and Canada. For the past several years he had conducted the Williams Apparatus Co. of Watertown, manufacturers of machines used in the testing of the strength of paper, the moisture content of pulp, etc. The size, in which he is now to deal, has been perfected by himself, and is much used in the treatment of paper to reduce its absorbency and render a smoother finish.

Decision as to whether the Unity Paper Mills, Inc., of Potsdam, should be declared bankrupt has been put off again, this time to Oct. 7. Postponement was ordered by Federal Judge Bryant upon the application of Bernard Wade and Arthur H. Martin, the receivers, and upon the motion of their attorney, Frank L. Cubley. The receivers set forth that the business has been conducted at a profit until last June, when there was a loss of $1,000 due principally to the setting aside of $900 for the bond account. The receivers

Increasing Production and Saving Wire

Inasmuch as the breast roll is driven by the tension of the wire it is important that it turn freely. The slightest drag or sluggish action caused by the frictional resistance of bearings will cause dragging and wasteful wear on the wire.

The immediate advantages to be secured from Hyatt Roller Bearings on breast rolls suggest their use not only for new machines, but also for machines now in service.



Breast roll journal box design, illustrating the application of Hyatt "D" type heavy-duty roller bearings.

The simple Hyatt housings effectively seal the lubricant in and keep water out, assuring continuous efficiency of operation and extending wire life.

Hyatt breast roll applications have been in successful service over a number of years in many of the leading American and Canadian mills. Let us send you a bulletin which has been recently prepared on Hyatt paper mill installation.

HYATT ROLLER BEARING COMPANY
Newark Detroit Chicago Pittsburgh Oakland

HYATT
ROLLER BEARINGS
PRODUCT OF GENERAL MOTORS

say this good showing is encouraging in a slow paper market when many mills are closed. No creditor or any one else has objected to the continuance of the business temporarily by the receivers. The receivers and bondholders are working diligently upon a plan of reorganization, the receivers state. The success of the plan is most hopeful and would result in benefits to all concerned, it was said.

Charles Gibbs with K. V. P.

Charles R. Gibbs, who has been connected with Bagley & Sewall Co. of Watertown for the past two years, has resigned to accept a position with the Kalamazoo Vegetable Parchment Co. of Kalamazoo, Mich. He will take charge of the mechanical and maintenance divisions of the Kalamazoo firm.

Mr Gibbs holds the degree of bachelor of science in mechanical engineering from McGill university in Montreal. He is a member of the American Society of Mechanical Engineers and the Engineering Institute of Canada. While connected with Bagley & Sewall, Mr. Gibbs carried on sales engineering work and also made several technical investigations in the interest of paper machine design and operation.

Edgar L. Dona of Watertown. for the past eight and a half years safety director of the St. Regis Paper Co. and the Northern New York Utilities, Inc., has been promoted to take charge of safety work for the central division of the Niagara Hudson Power Corp. Mr. Dona's headquarters are in Syracuse and he has already assumed his new position.

George A. Lawyer of Watertown and George W. Sisson, Jr., of Potsdam have been named members of the advisory committee of the New York state wood utilization committee which will shortly start a survey of New York State to determine possible uses of wood waste. The appointments were made by Secretary of Commerce Thomas W. Lamont.

The Bagley & Sewall Co. is now completing a second Fourdrinier paper machine for the Volga river mill of the Russian Soviet government. Shipments of portions of the machine are now being made, but the cast parts will not go until the latter part of this month. In the meantime Richard Grey of Watertown, chief installation engineer of the Bagley & Sewall Co., and his crew sent to Russia last summer to install and place in operation the first Bagley & Sewall machine made for the Soviet government, will remain in Russia. They will not return to this country until the second machine has been set up and a crew of Russians taught to operate it.

The National Paper Products Co. is building a 3.500-foot pipe line system between its two Carthage plants. Wooden pipes will carry sulphite from Plant No. 1 to Plant No. 2. No pumps will be required for the sulphite line as there is a sharp grade in it. Groundwood will be forced from Plant No. 2 to Plant No. 1 by means of pumps.

A meeting of the conservation committee of the New York State Economic council was held at Lake Placid on July 21. Prof. Edwin E. R. Seligman, vice-president of the Association for the Protection of the Adirondacks, urged a more liberal state forestry policy so that industry might benefit from use of the forests. He believes the state can realize a hundred million dollars annually from its forests if industrialists adhere to a fair program of forest management.

A new corporation known as the Harrisville Filing Folder Corp. started the manufacture of folders for filing cases at the Harrisville Paper Co. plant on July 28. The Hano Paper Corp. of New York city has leased a storehouse at the Harrisville plant and the paper company will furnish the product for the folder. Previously the Hano Co. had been buying the product but now it has entered the manufacturing end. The product is made from heavy tag board of 150-pound basis. New machinery was purchased and installed for the manufacturing process. The Harrisville Paper Co. is part of the St. Regis chain and is engaged in the manufacture of specialties.

Prospects of the Newton Falls Paper Co. for the coming year look fairly bright, R. C. Shepard, treasurer, said after the annual meeting on July 24 at Newton Falls. He said the mill, which manufactures book paper, is now operating at full capacity, and that the past year has been one of the best in sometime for the Newton Falls concern. The following directors attended the annual meeting: E. S. Wilsey, Mason Britton, Fritz Frank, A. C. Pearson, C. A. Musselman, Jay Mason, W. H. Wynkoop, C. A. Barbour, William Hearst and Col. Chevalier.

St. Regis Acquires Bates International

Entry of the St. Regis Paper Co. into the multi-wall paper bag business in more than 40 foreign countries is announced in the acquisition of the Bates International Bag Co. which in the past few years has licensed a large number of manufacturers to produce these bags under Bates patents.

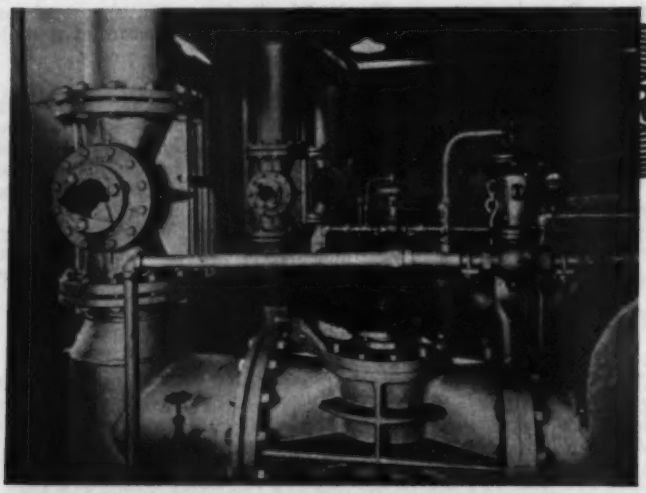
With this new subsidiary and the Bates Valve Bag Corp., owned by St. Regis Paper Co. since February, 1929, and a leading producer of these bags in the United States and Canada, the St. Regis group is now provided with coverage in a large part of the world for development of Bates patents on multi-wall bags, cement packers and bag manufacturing machinery. The extent of the foreign business handled by the 30 different licensed companies, in many of which Bates International Bag Co. holds a stock interest, which in some instances amounts to control, is indicated by the increase in sales during the past five years. Sales of multi-wall paper bags, used for packing cement and other rock products, by these foreign affiliated concerns, increased from 800,000 bags in 1925 to 138,000,000 bags in 1929.

The International Paper Co. has decided to continue operations with two large machines for an indefinite period at the Pyrites paper mill, according to notice received by W. N. Baker, superintendent of the plant. Heretofore four machines were utilized. Some reductions in the working force were necessary. Late in May, orders were received to shut down the entire plant July 1. Mr. Baker went to New York to confer with officials of the company and it was decided to modify the earlier instructions. Mr. Baker said no decision had been made relative to operations at the Ogdensburg terminal, which handles the pulpwood which is used at the Pyrites plant.

The United States patent office has announced the award of a patent to Alfred Clement Coty and Thomas Earl Coty of Watertown for the invention of a machine for putting bottoms on paper bags. They applied for the grant on May 17, 1928. The patent is made up of eight patentable features.

More than 21,500,000 trees have been planted in New York State by companies of the Niagara Hudson system, and an additional 5,000,000 will be planted this year. This work will, over a period of years, convert waste land into valuable timberland and protect the watersheds of a number of the system's hydroelectric plants. Most of the planting has been done in the Adirondacks region. Northern New York Utilities Co. is the leader. Malone Light and Power Co. has planted 2,500,000 trees and will plant another million this year. Niagara, Lockport and Ontario Power Co. has planted 500,000 trees on the Salmon river watershed and will plant an additional 200,000 this year. Substantial reforestation has also been done by St. Lawrence Valley Power Co. and New York Power and Light Corp.

Notice has been received of the resignation of H. D. Carlton as president of Consolidated Ashcroft Hancock Company, Inc., Bridgeport, Conn. and vice-president of Manning, Maxwell & Moore, Inc., effective July 3, 1930.



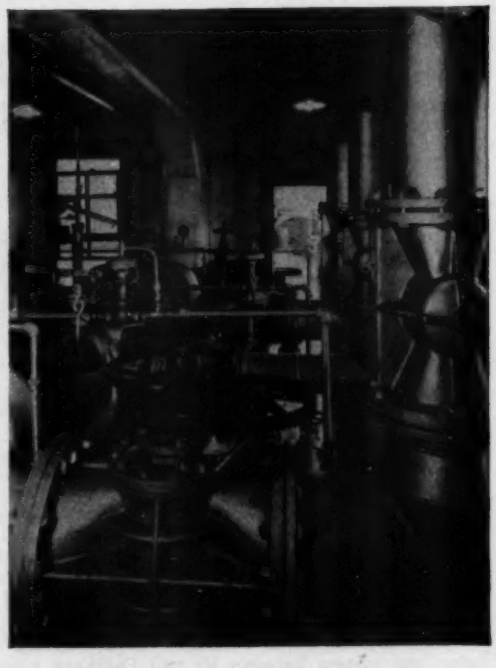
NEVER A LEAK

Lubricant Seals The Plug

Nordstrom Valves are leak-resistant because lubricant under pressure forms a seal between the contact surfaces of the plug and its seat and renders the valve tight against leakage without abnormal pressure of the plug on its seat. Nordstrom Valves are always easy to turn because the lubricant exerts an upward pressure on the base of the plug which releases the plug instantly should it ever be tight. A turn of the lubricant screw seals, unseats and lubricates the valve.

"Merco" Lubricants and Pipe Compound

There is a special "Merco" Lubricant for every valve service. Our engineers will gladly recommend the lubricant adapted to your particular requirements. "Merco" Pipe Compound seals screw thread or gasketed joints. Will not corrode or freeze the joint. Readily applied with a brush.



Illustrations show Nordstrom lubricated Valves in service in the plant of an Eastern Power Plant.

MERCO NORDSTROM VALVE COMPANY

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Boston - 134 Boylston St.
Buffalo - Genesee Bldg.
Chicago - 170 W. Adams St.
Dallas - Magnolia Bldg.
Detroit - 2642 West Grand Blvd.
El Paso - 111 So. Virginia St.
Houston - Petroleum Bldg.
Los Angeles - 556 So. San Pedro St.
New Orleans - Masonic Temple Bldg.
New York - 11 W. 42nd St.
Pittsburgh - Clark Bldg.
St. Louis - 317 N. Eleventh St.
San Francisco - 343 Sansome St.

Agencies:

Denver - Republic Supply Company, 332 Continental Oil Bldg.
Honolulu - W. A. Ramsay Co., Ltd., Fort & Queen Streets
Manila - E. W. Sharp, c-o J. A. Murphy Co. Perez Samanillo Bldg.
Philadelphia - Brown, Wilson & Company, 1600 Arch St.
Saginaw - Arthur C. Beckert, 112 Durand St.
Salt Lake City - National Equipment Co., 131 West 2nd South St.
Tulsa - B.V. Emery & Company, 218 E. Brady Street

Factories in U. S. Oakland, Calif. and Belleville, N. J.

Canada - Peacock Bros., Ltd., Montreal, Toronto, Winnipeg, Vancouver. (Also Sydney, N.S.)
England - Audley Engineering Co., Ltd., Newport, Shropshire.
Buenos Aires, Argentina, - General Electric, Soc. Anon., Victoria 618 Esq. Peru.

Nordstrom Valves

WISCONSIN

Mills Show Gain for First Half Year

With two of the largest paper companies in Wisconsin showing decided gains in sales and earnings for the first six months of 1930 and others proceeding with improvements and expansion, it can be said that a condition of marked stability exists despite the general business depression.

Some mills have closed down temporarily. A few others are running on reduced schedules or have cut down the number of machines in operation. The usual summer slump added to a decline in orders led to this condition with some, but jobbers are expected back in the market soon to replenish greatly reduced stocks and production is believed to be due for an ascending scale for the next six months.

Kimberly-Clark Corporation, Neenah, went through the first half of the year with a highly satisfactory record. Net earnings were $1,527,000 for that period as compared with $1,366,259 for the first six months of 1929. This means $3.05 a share on 499,800 shares of common stock as against $2.73 a share for the corresponding period a year ago.

For the second quarter of 1930, the net earnings were $832,648, equal to $1.66 a share on common stock, compared to $694,932, or $1.39 a share the first quarter of this year.

Earnings of the Northern Paper Mills, Green Bay, plus those of its subsidiaries, were $244,366.39 for the first six months of this year. With earnings $187,439.49 for the corresponding period of 1929, the increase is 30 per cent. This equals $2.93 on common stock, which is now being marketed at $40 a share on a cash dividend basis of 50 cents per share per quarter. A five per cent increase in sales accounts for part of this showing, but large scale economies of a new power plant, faster machinery, new buildings and more modern equipment are responsible for reductions in overhead which made this new net earning record possible. The Northern group includes: Northern Paper Mills and Northern Electric Co., Green Bay, Wis.; Tuttle Press Co., Appleton, Wis.; Paper Service Co., Chicago; Patten Timber Co., the Cloverland Supply Co. and General Paper Mills, Inc., Amasa, Mich., and Northern Paper Mills, Ltd., Coppel, Ont.

About $50,000 is being spent by the Escanaba Paper Co., Escanaba Mich., on alterations and new equipment so the No. 1 machine can be shifted from newsprint to wall paper. The company has closed a ten year contract with the United Wall Paper Co. and Sears, Roebuck & Co., according to Joseph H. Slater, manager. An addition is to be built to accommodate the sizing and chemical facilities for wall paper manufacture. The company also is buying new beaters, stuff chests, refining engines and screens, and a winder drive and slitter. Changes also will be made in the pulp mill and larger motors installed so as to increase capacity.

At Stevens Point, the Stevens Point Pulp and Paper Co., a subsidiary of the John Strange Paper Co., is completing a building two stories high, 40 by 60 feet, for new boilers and other new power equipment. The company also is modernizing its chemical department. The intention is to increase capacity and reduce operating costs by removing obsolete facilities.

A new company to be known as the Menasha Paper Corporation has been organized at Menasha, Wis., presumably to take over the mill of the defunct Menasha Paper Mills Co. The incorporators have not yet been made public. The mill referred to above was sold at auction recently and the successful bidder was William Nelson, secretary-treasurer of the old company and also secretary of the Menasha Wooden Ware Co. It was announced at the time of the sale that the mill would shortly resume operation. The capitalization of the company is 2,400 shares of no par value.

Most of the construction work is completed for the large addition to the Tomahawk Kraft Paper Company's Mill at Tomahawk, Wis. A second paper machine is to be installed and operation will be started in the late fall. The company has obtained $750,000 in new capital for the expansion. The annual meeting was held recently at which the officers were re-elected. They are: A. L. Kreutzer, president; John F. Ross, first vice-president; S. B. Bugge, second vice-president and general manager; D. C. Everest, secretary-treasurer; I. M. Carney, assistant secretary-treasurer.

Expansion also is taking place at the Schulz Shoe Box Co., Milwaukee. The company has leased buildings containing 30,000 feet of additional floor space. Machinery is to be added so as to increase production 25 per cent at once, making monthly shipments 600,000 cartons.

Approximately half a million dollars will be spent by the Northern States Power Company on the Dells dam at Eau Claire, Wis. A stilling basin running almost the length of the dam will be built so as to protect the structure from backwash. A concrete flume will replace a wooden one so the water wheels will have a smoother flow of water and faster operation. Later a concrete breakwater will be built for the tail race and will be lengthened so as to increase the draught on the water wheels. This dam was acquired recently from the Dells Improvement Company, the power subsidiary of the Dells Paper and Pulp Co. and power now is supplied the mill by the Northern States company under provisions of the deal. The pulp grinders of the mill have been moved to a new building and three new generators have been installed in the old building, which is now a generating station.

George A. Whiting

The career of a veteran papermaker, one of the oldest pioneers of the industry in the State of Wisconsin was brought to a close when George A. Whiting, president of the Whiting Plover Paper Co., Stevens Point, Wis., and the George A. Whiting Paper Co., Menasha, Wis., passed away at his home in Neenah, Wis., July 17, at the age of eighty-one years.

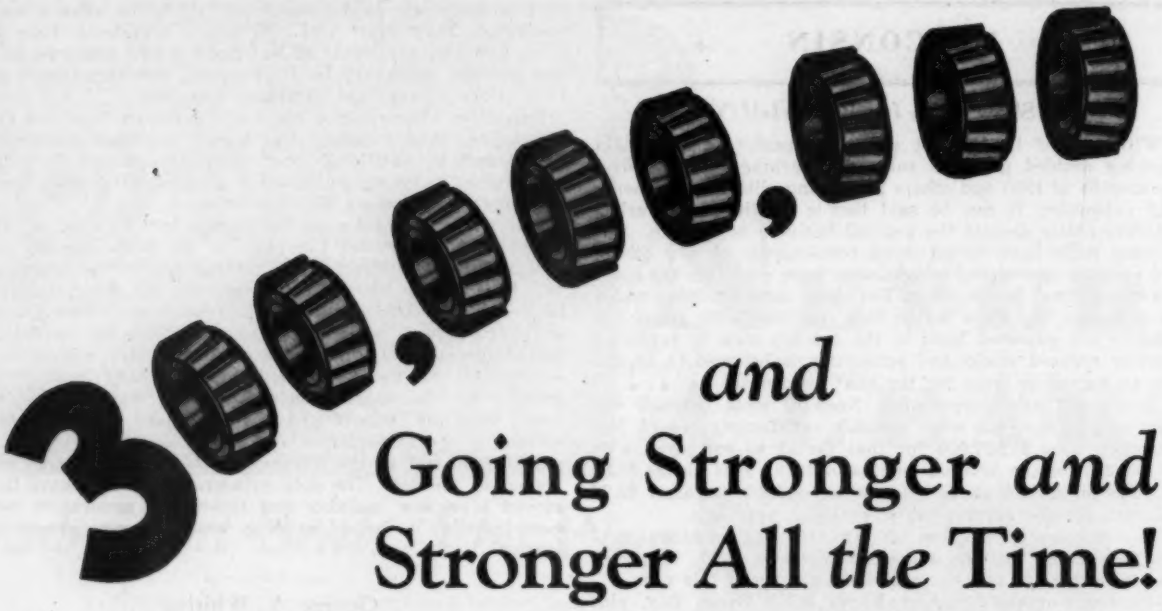
Mr. Whiting was born at Whiting Hollow, Schoharie county, New York, June 6, 1849, and came west with his family at the age of five years. Due to his thrifty habits he was able while yet a young man to embark upon a business career for himself, and took an interest in the organization of the Kimberly-Clark Company. This was in the days when there were few paper mills in that section. He later withdrew from Kimberly-Clark to associate himself with the Winnebago Paper Mills (now Bergstrom Paper Co.) in which connection he remained for a number of years. In 1881 Mr. Whiting formed a partnership with William Gilbert of Chicago from which association the George A. Whiting Paper Co., Menasha, had its inception. The business was successfully carried on until 1886, when Mr. Whiting bought out the other partner's interest and has owned and operated the plant since that time.

In 1893, Mr. Whiting was instrumental in organizing the Plover Paper Co., and has remained as its president since the organization. In 1912, he bought the interests of the other stockholders and changed the name to Whiting Plover Paper Company. Since that time the mill has been entirely remodeled, the most up to date equipment has been installed, and it is now one of the most complete and modern paper mills in the state.

Through the Fox River valley and his immediate community, Mr. Whiting has been loved and will long be remembered for innumerable kindnesses and benefactions, and the many industrial and charitable organizations founded and sponsored by him stand as fitting monuments to a life well spent.

Mr. Whiting is survived by a widow and one son.

A merger of considerable proportions has been declared operative involving the International Printing Ink Corporation, and the dyestuffs and chemical division of the Newport Co., Carrollville, Wis. The new name will be the International-Newport Chemical Corporation and will be capitalized at $25,000,000. The consolidation is subject to approval of the stockholders, but officers say enough stock has been deposited to assure the consummation. A subsidiary will be organized to manufacture printing ink. The Newport com-



300,000,000 *and* Going Stronger *and* Stronger All *the* Time!

ALREADY *three hundred million* Timken Bearings have been placed in service in all kinds of machinery, with the greatest satisfaction to manufacturers and users.

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TIMKEN *Tapered Roller* **BEARINGS**

pany will retain and continue to operate its wood distillate plants at several points in the United States.

John Strange Co. Floats Bond Issue

Capital expenditures made recently by the John Strange Paper Co., Menasha, Wis., will be financed through a first mortgage bond issue of $500,000 which will be handled by six neighboring banks. Bonds drawing seven per cent and maturing Sept. 1, 1930 will be retired. The company also will repay $300,000 spent for a new power plant, and will pay off an old mortgage of $100,000. The new bonds pay six per cent.

Current assets of the company are shown to be $454,456 and current liabilities $121,807. Assets pledged to secure the loan amount to $1,374,166. The future outstanding obligations will be the new mortgage of $500,000, preferred stock of $187,375, common stock of $408,250 and surplus of $858,476. The company was organized in 1888 and produces 150 tons daily of paperboard, mill wrappers and high grade kraft and sulphite papers.

Safety history was made at the Consolidated Water Power and Paper Co. when on July 14 its four mills with 1,110 employees had operated for 68 days without a lost time accident. The Biron mill had 173 days to its credit, the Appleton mill 148 days, the Stevens Point mill 97 days, and the largest mill at Wisconsin Rapids 68 days. The last-named has 533 employees. This was accomplished largely through educational campaigns and without contests.

Objection has been made by the Combined Locks Paper Co., Appleton, Wis., to the awarding of a government contract to the International Paper Co., New York, for the sale to the latter of $5,438,000 worth of pulpwood from federal forests in southern Colorado. The Combined Locks company made a higher bid on 2,000,000 cords and wants the contract divided so the International may buy only that portion on which its price was the highest.

Establishment of another federal forest in Wisconsin amounting to 275,000 acres is contemplated. Officials and lumber companies owning cutover lands in Price, Ashland and Sawyer counties have held conferences and expect to push the project for adoption by the Government under its plans to set aside one million acres in this state for reforestation. The Nekoosa-Edwards Paper Co. is encouraging the project, and has given demonstrations of the possibilities of tree growing. H. Basil Wales has been appointed as assistant regional forester by the Government, and will be in charge of forest management under the direction of Earl W. Tinker, regional forester with offices at Milwaukee.

The Consolidated Water Power and Paper Co. is completing construction of a new wood room at its mill at Biron, Wis., and also is building a new Giebels wall 430 feet long on its dam at the same place. The wall is being raised three feet at the same time. A new pulp hoist also is being installed at Ashland, where the company receives its pulpwood by raft from Canada via its shipping subsidiary, the Newaygo Tug Line. The hoist will run logs up jack ladders and drop them into receiving bins where they can be chained and loaded onto cars two cords at a time. The company has rafted two shipments of wood safely across Lake Superior with its tug Butterfield this summer. The last one contained 12,000 cords of spruce logs valued at $125,000.

The Kimberly-Clark Corporation's large mill at Kimberly, Wis., recently completed 78 days of operation without a lost time accident. Employees celebrated the event with a pavement dance.

In the reorganization of the Whiting-Plover Paper Co., Stevens Point, Wis., following the recent death of its president, George A. Whiting, the following officers were elected: President, A. E. Oberweiser; vice-president, Frank B. Whiting; secretary, George Hilton; treasurer, Mr. Oberweiser. J. H. Miller is manager of the mill. Mr. Oberweiser has been active head of the company for 22 years. Mr. Hilton, of the law firm of Bouck, Hilton, Kluwin & Dempsey, Oshkosh, Wis., was made a director to fill the vacancy on the board.

Tariff Notes

Railroads operating in Wisconsin have petitioned the Interstate Commerce Commission to include the newsprint rate situation in the general investigations now being made relative to all rates. The roads object to the "frozen set up" by which rates are fixed according to a decision reached in 1922 in a case brought by the Minnesota and Ontario Paper Co. All rates for other kinds of paper are based on a percentage above newsprint. The roads also declare that rates fixed for paper mills of the Fox River Valley are used for all other territories and groups in Wisconsin, Minnesota and upper Michigan. These methods of basing rates therefore make it impossible to change rates anywhere, because all other rates would have to be changed in proportion. The railroads contend that newsprint rates in Wisconsin are too low and that roads are at a disadvantage because of the lack of density found in other regions. They desire a general scale of rates for all producing territories, even though it may be below a normal maximum. They also wish to remove the percentage basis by consolidating the group in Class A (newsprint and blank wall paper) with Class B (printing, book and wrapping paper). Any losses they thus sustain they believe will be made up from general increases in newsprint.

The Ann Arbor Railroad has filed objection with the commission to reopening a case of the United Paperboard Co. in an effort by the latter to obtain lower rates on wood pulp board from Urbana, Ohio, to Chicago, Ill. The commission previously fixed a rate from Ontonagon, Mich., to Menasha, Wis., of 18.5 cents covering a haul of 253 miles, while the United pays 20 cents for a haul of 268 miles. The railroad contends that rates of a remote territory should not govern and that comparisons should be made in the same area, where transportation conditions are the same.

Two fatal accidents have occured recently. George Hoard, an employee of the Mosinee Paper Mills Co., Mosinee, fell 70 feet down an elevator shaft to his death. Alfred Fallman, employed by the Escanaba Paper Co., Escanaba, Mich., suffered fatal injuries when a cable broke while he was working with a crew repairing the Boney Falls dam.

Wisconsin paper mills and other water power users have been assessed tolls of $52,956 for the use of dam sites. The rates were fixed by the Wisconsin Railroad Commission. The highest amounts were paid by the Consolidated Water Power and Paper Co., $5,113, and the Nekoosa-Edwards Paper Co., $7,398.

The International Paper Co. has transferred W. W. Hinnenthal from the management of the Marinette and Menominee Paper Co., Marinette, Wis., to Mobile, Ala., where he will be general manager of a new bag factory employing about 500 men. He had been in charge of the Marinette plant for about nine years.

After conducting the sales and advertising departments in Chicago for more than a year, the carton division of the Marathon Paper Mills Co. is moving them back to the factory offices at Menasha. Other departments which had been moved to Chicago were transferred back sometime ago. About 25 employees were included in the transfer.

An estate of approximately $3,000,000 was left by George A. Whiting, recently deceased. Most of the money goes to his son, Frank B. Whiting after making provision for his

"the same as Foxboro"

The Original
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How often have you heard this?

"We can give you a Round Form case the same as Foxboro."
"We can furnish a 'flapper valve' the same as Foxboro."
"Our V-Port Valve is the same as Foxboro."
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We like to hear that.

It proves that Foxboro sets the Standard for Appearance, Accuracy, Convenience and Performance.

But Foxboro can never be successfully imitated.

Pulp and Paper Companies, from coast to coast, are finding that out. They are taking care to specify Foxboro Automatic Temperature Recorder-Controllers on their Dryer and Calender Rolls, Waxing Machines, Size Vats, Parchment Tanks, Gummed Paper Dryers, Glue Tanks and Cookers, Wall Board Dryers, Rosin Size Preparation Tanks, Drying Rooms and everywhere else that the control of temperature to a specific degree is required.

If you want satisfactory temperature control, write to us,—Dept. P. N. We can help you.

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THE COMPASS OF INDUSTRY

INSTRUMENTS *for* CONTROLLING, RECORDING *and* INDICATING TEMPERATURE, FLOW, HUMIDITY *and* PRESSURE

widow, and bequests to Lawrence and Ripon colleges and Theda Clark hospital, Neenah, Wis.

The death of William N. Brunaugh, sales manager of the Milwaukee Lace Paper Co., Milwaukee, occurred recently following an operation for appendicitis. He had served the company as sales manager for four years.

ENGLAND

Paper Trade News and Conditions

From the point of view of the British paper manufacturers, the Board of Trade returns for the month of May and for the first five months of this year are not satisfactory, as imports for May show an increase of over 200 tons over those of the same month last year, and the increase for the five months is slightly over 31,000 tons. Analysis of these figures reveals the fact that the increases are concerned almost entirely with printings, writings, cardboard, and strawboards.

Our exports for the same period have declined to the extent of 5,000 tons less than last year, but this is more than accounted for by the sudden drop in exports during May, which were 7,500 tons less than in May of last year, and prior to this there was a slight increase. The import figure of raw materials is also down by 27,000 tons, which goes to confirm the report from the mills trading in printings and writings that trade is indifferent. Adding the increased import figure and the decreased export figure British trade will be seen to have suffered to the extent of about 37,500 tons.

Better conditions are reflected by the reports on the wrapping section. Imports have been reduced 2,500 tons, and at the same time exports have increased about 300 tons. These figures rather go to show that with the assistance of the safeguarding duty, the British makers of this class of paper have been able to hold their own. That they are doing more than this is evidenced by a statement made at the annual meeting of A. E. Reed & Co., Ltd., that since the starting of this company's new machine for the making of kraft paper, which, incidentally is the largest of its kind in Europe, the story of its development has been one of the uninterrupted progress. The estimated output of this machine is 300 tons a week, and it is anticipated that even this will be improved upon. The chairman of this company stated that without the help of the safeguarding duty the new branch would never have been started.

The resolution of the conference of the leading British bankers in favor of Empire Free Trade, and the imposition of import duties on all products and manufactured goods from foreign countries has caused large consumers of paper to ask how such a policy is likely to affect them. It has been recalled that in 1919-20 when imports of paper were restricted and only allowed to be brought into the country under license, prices were higher than during the last few years of the war. With memories of these inflated prices some users do not favor the restriction of free imports of paper from foreign mills. In the trade, however, it is felt that the present conditions in the paper industry are so different from those which obtained at the time of this former restriction, that fears of a return to abnormal prices are groundless.

Far from any likelihood of a shortage of supplies, the output possibilities are now so great that with all the available machinery working at 100 per cent capacity there would be at least a twenty per cent surplus. Moreover, it has to be borne in mind that new machines are still being built.

As far as the continental mills are concerned, if an import duty of 20 to 25 per cent were imposed for a short term of years as the Safeguarding Duty on Wrappings, it is felt that they will follow the same policy as the makers of foreign wrappings, and lower their prices in order to hold a fair percentage of their orders, in the hope that at the expiration of the term a change of Government would repeal the tariff. If, on the other hand, import duties should be accepted as a national policy by all parties, it would not pay the continental makers to sell at a loss indefinitely.

With the elimination of continental competition, the field would be left open to Canadian, Newfoundland, and domestic papermakers to meet the growing demands of the newspaper proprietors in this country. It is not anticipated that the British papermaker or his employees would benefit to any appreciable extent by the mere transfer of supplies from continental to Canadian producers at the present import prices; but if a standard price of, say, $62 a ton delivered, were fixed, it would add a great stimulus to trade and encourage the investment of fresh capital in the erection of new mills and machinery, so that by the time the Canadian mills were wanting their surplus capacity to meet the increased demands of the United States publishers, our own mills would be able to supply the entire quantity of that needed for the home market, and internal competition would then be sufficient to keep prices in ratio to costs of production.

Reverting to the Board of Trade returns, a striking feature is the large tonnage of strawboard which we now import. The reason is explained by the fact that this is one of the sections of the paper trade still suffering from disabilities similar to those with which the early makers of kraft paper were troubled, in so far that the trade has been so long in the hands of foreign makers that it is difficult to persuade users that equally serviceable and sometimes better boards can be made in this country. British strawboards are a very dull brown color, while those of foreign make are of a straw color, and this difference in color alone is strangely enough accountable for a great deal of the prejudice of users. An advantage claimed for existing British makes against those of foreign origin is that they are not so harsh and will bend without cracking, and that they are less absorbent and will therefore take the paste better.

Another fact revealed by the returns is that we are now importing considerably more newsprint paper from Newfoundland and Canada than from Scandinavia. Not many years ago, Norway and Sweden were our chief sources of supply, but they are now sending us less than Finland which is a comparative newcomer as far as paper of this description is concerned. In spite of the low prices quoted by the foreign makers the big modern mills in this country are holding their own, but this has only been made possible by the tremendous expenses incurred in the installation of new machines. Many of these mills are working at nearly maximum output.

Reviewers of trade conditions state that there is not likely to be much change for the better for the British papermakers for at least another twelve months, and that the starting up of some of the new machines now in course of construction in this country may be delayed because our own affairs are so bound up with the influence of those of the paper producing countries like the United States, Canada, Germany, Finland, Sweden, and Norway, whose producing capacity is growing out of all proportion to their consuming capacity, with a result that the present keen competition for our trade is likely to continue.

It is reported that the first paper for the production of paper from seaweed is nearing completion at Novosibirsk in Siberia. The method has been invented by a Russian engineer for exploiting the 100,000 tons of seaweeds which the Chansk district can supply annually which seaweed is said to be almost pure cellulose, and their conversion to paper takes less than half-an-hour. Sixteen kinds of paper, as well as cardboard and glue, have been obtained from the seaweeds, and the waste is used to produce a fireproof plastic mass which can be manufactured into tiles and other products.

The many friends in North America of G. H. Hedley, chairman of St. Anne's Board Mill Co. Ltd., Bristol, England, and of G. H. Hedley Ltd., of Loudwater, will be grieved to know and will sympathize with him in the very sad loss which he has suffered in the death of his wife. On Sunday, July 6, Mr. Hedley was motoring with his wife when his car skidded and crashed into a touring bus, as the result of which Mrs. Hedley received fatal injuries. Mr. Hedley suffered minor injuries and severe shock from which he is now recovering.

Eleven car-loads of Effective Lubrication

ONCE again an important lubricating job goes to Texaco. Eleven car-loads of Texaco Lubricants are shipped from one of The Texas Company's refineries as the initial order to cover the entire lubrication requirements of another large user of lubricating oils and greases. It is a vote of confidence in the superiority of Texaco Lubricants from a company which, for the past 40 years had been using other lubricants exclusively.

Texaco today lubricates more railroad car-miles than any other oil company. Texaco Lubricants are used in the mining plants producing nearly two-thirds of the country's copper and in a large and growing percentage of the great industrial plants, power houses, factories and transportation systems throughout the world.

The high quality of Texaco Lubricants and the excellence of Texaco Lubrication Service are recognized everywhere. Write The Texas Company first.

TEXACO LUBRICANTS

THE TEXAS COMPANY
135 East 42nd Street, New York City.

Practical Helps for the Mill Man

Prevent Tool Waste

A GOOD mechanic is generally fond of his tools. He prizes them very highly, always chooses them with discretion, uses them properly, and gives them the care which they deserve. When a task is finished, the tools used on the job are cleaned and returned to their proper place—whether it is bench or chest. Order is essential.

Much time is lost by a careless mechanic in tackling a job because his tools may have been misplaced, are not in order so that the tools required for the job may be obtained easily and quickly, or the tools may even require cleaning before use. Such a loss of time may result in serious loss to his company or might even result in loss of life.

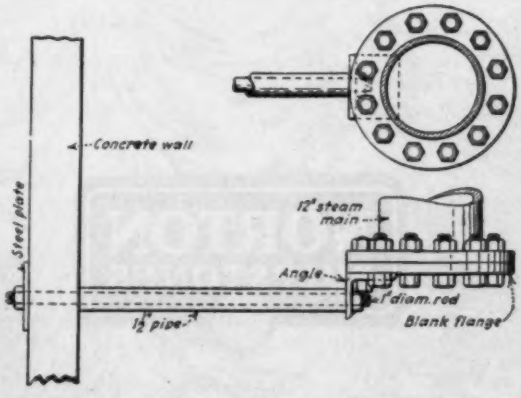
To hasten work on a job, a careless mechanic might use a screwdriver as a chisel, a monkey wrench as a hammer or other tools not suitable for the task. Even a wrong selection of tools for a certain task might be made which would necessitate doing the work over more quickly than would ordinarily be required if the task be one of maintenance.

In the course of a year many tools would be neglected by a careless mechanic when not in use. Some tools might even be left at points where jobs were done, and forgotten. Forgotten tools result in lost tools. Lost tools or improperly kept tools mean waste.

A check-up on the waste which occurs in the average plant or even department would reveal information of value.

Steam Pipe Anchor

A SIMPLE and effective anchor for a vibrating steam pipe was described by T. W. Bean in the July 22, 1930 issue of **Power**. The anchor was required to overcome lateral vibration which was set up in a 12" steam main by three reciprocating engines that were connected to it. Space did not permit the use of rods and turnbuckles arranged to exert



a pull on each side of the pipe. Therefore, a 1" steel rod installed through a sleeve of 1½" pipe was used to tie the end of the steam main to an adjacent wall. The pipe sleeve prevented lateral movement in one direction while the rod stopped movement in the opposite direction. The rod extending through the wall was fastened by a steel plate and nut. The other end of the rod was fastened to the blind flange at the end of the steam main through an angle iron bolted to the flange.

Such a scheme is extremely simple and it was said to stop all vibration when the nuts on the ends of the rod were tightened.

Accident Indicator and Safety Slogan Box

AN interesting safety slogan and accident indicator box described in the June 1930 issue of the **National Safety News**. This box, as illustrated, was constructed of sheet iron and was slotted on one side for the insertion of a card sign

with transparent letters. The slotted arrangement for the sign makes it convenient for changing the sign whenever desirable. Within the box are located six translucent bulbs and a red and green light in each of the two ends. The arrangement of bulbs permits the green light to burn at all times when there are no accident days. The red light is turned on when there is an accident.

Naturally it is the desire of every employee and the management to keep the green light burning.

Such a box should be located in a conspicuous place in the plant. If properly located, it should create considerable interest.

Storing Pulpstones

A PULPSTONE when freshly quarried is green. Sometimes a stone is shipped in this condition or is only partially seasoned. A stone seasons best in the open air but should be protected from the weather and from moisture in the ground. It should never rest on the ground, or on any-

thing containing moisture due to its porosity. A free circulation of air should be permitted to reach all surfaces. Uneven hardness in a stone causes it to break when placed under very severe stresses or strains. Appreciating the care which pulpstones require for proper seasoning and storing, one manufacturer in the construction of a groundwood plant found it worth while to include a separate storage room for stones. This room was located adjacent to the grinder room but was free from all moisture and dampness. It was well ventilated and provided a free circulation of air among all stones in storage. The arrangement of the stones in the room may be obtained by viewing the accompanying illustration.

THE cement center Norton Pulpstone (formerly made in the smaller sizes only) has demonstrated its worth, its dependability. Time tests of all width stones under varying pulp mill conditions have proved the cement center so satisfactory that this type has now been adopted for *all* sizes.
The underlying engineering principles in the Norton stone are unchanged. The necessity for returning centers when renewals are necessary has been eliminated.
NORTON
PULPSTONES

NORTON COMPANY
Worcester, Mass.
Canadian trade now supplied from Canadian plant

Canadian News

Position of the Canadian Newsprint Industry

According to the Canadian Bank of Commerce, a study of the present state of the newsprint industry brings to light some encouraging features, that is, encouraging as viewed in relation to world industry as a whole. The market for Canadian newsprint lies almost entirely in other countries, chiefly the United States, and an analysis of our exports and of American imports and consumption gives a good idea of the situation. The volume of exports for the first four months of 1930 was only 4 per cent less than in the same period of 1929, practically all of the decline being acccounted for by smaller shipments to the United States, for while those to the United Kingdom were appreciably less, they were almost offset by larger sales to other overseas countries, notably Argentina.

Not withstanding a decline in advertising in the leading American centers, as well as in the circulation and in the number of pages in Sunday editions, the total newsprint requirements of the United States seem to be very slightly, probably only 1 per cent, below those of a year ago. The difference between this decline in American requirements and that in Canadian exports to the United States appears to be represented mainly by increased imports of newsprint from Scandinavia and Finland, and by an increase in domestic production, partly the result of larger imports of pulpwood, some of which came from Russia. Such a diversion as this, however, has had little effect on the operations of Canadian producers.

The present price of newsprint cannot, of course, be regarded as satisfactory, but it has not been drawn into the trough of the recent general price depression, and there is the prospect of some improvement next year as the result of discussions between leading interests, producers and buyers, on both sides of the border. The Newsprint Service Bureau reports that last year the industry was operating at over 80 per cent of rated capacity, as compared with 75 per cent at this time, but the decline is due to the opening of new mills rather than to falling off in business. The latter, too, is the same as that aimed at when the rationalization plan was adopted in 1929, and it would be reasonably satisfactory if it could be maintained the year round.

The position of the industry has, of course, been strengthened somewhat by the mergers which have taken place with a view to reducing costs. While there is still room for improvement, the conclusion to be drawn from these facts is that to-day the newsprint industry occupies a favored place in world business and that fundamentally it is strong.

Newsprint Prices Unchanged

Publishers in the United States have received no notice from Canadian newsprint manufacturers of an intention to raise prices at present. When the present arrangement as to price was made, it was stipulated that the Canadian mills would give 30 days' notice of an intention to avail themselves of their privilege to raise prices after the first half of the year 1930. Since no such notice appears to have reached the consumers in the United States, it is to be assumed that prices will remain as they have been until the beginning of 1931 at least.

One United States consumer of newsprint made the rather naïve statement that "We have not seen any notice of a price increase, and I do not think we will see any this year. The manufacturers would be foolish to try to raise their prices in the face of present conditions. They know newspaper publishers cannot afford to pay any more than the present price for paper this year." In view of the jubilant statistics of enormous growth of the newspapers of the United States during the decade from 1920 to 1930, just published, this allegation of inability to pay a small increase in the cost of newsprint, if it should be asked, borders on comedy.

Kraft Price Increase

Announcement that International Paper has raised the price of kraft paper in the Southern States from $70 to $75 a ton is expected to be followed by Canadian manufacturers. For several months past the kraft market has been rather unsettled, largely due to excess of productive capacity over demand. This excess is probably about 30 to 40 per cent above consumption. Instead of reducing operations to bring output nearer to demand, producers, faced in many cases with heavy fixed charges, have for extended periods operated at full capacity, dumping their excess production at unprofitable prices.

There are several kraft producers in Canada, chiefly Wayagamack and Dryden. The latter company has a contract with the Bates Value Bag people for the major portion of its production, and operations have been well maintained. Moreover, the balance is marketed largely in the Western Provinces, where the company has established a good outlet for its product. While the lower prices for kraft to date have affected the dollar volume of its business, it was recently stated that the company has been getting along nicely this year.

No Discrimination Against Small Publishers

The Federal Trade Commission of the United States submitted its report on newsprint to the Senate on July 3rd. As a result of the investigation no evidence was disclosed of unlawful discrimination against publishers of small daily and weekly newspapers by manufacturers and distributors of newsprint. Among other things, the commission noted a tendency to monopoly in the Pacific Coast region and made a recommendation that the Newsprint Institute of Canada should be watched for any activities contrary to the anti-trust laws of the United States. Considerable interest in the report was displayed in Canada, as it charged that coercion by Premiers Ferguson and Taschereau had been responsible for an increase of $5 a ton in the price of newsprint to the Hearst newspapers, and recommended that Alaskan mills might be developed to prevent a further price raise.

When interviewed on the subject, Col. J. H. Price, president of Price Bros. and Co., stated that there was no further rise impending in the price of newsprint. While it seemed to Col. Price that the further developments of mills in Alaska is only a natural move, this does not give rise to any feeling of uneasiness among the Canadian manufacturers, for there are many difficulties surrounding such a move, and an enterprise of that type would hardly be feasible as long as newsprint sells at our near present levels.

On his return to Quebec after a holiday trip on the north shore of the Lower St. Lawrence, Premier Taschereau expressed surprise over the Washington despatch describing the recommendations of the Federal Trade Commission. On being asked to comment on the section of the report which read "the International Paper Co. was induced to agree to an increase in the price of newsprint to Hearst papers by threats of disciplinary action on the part of the Prime Ministers" (of Ontario and Quebec), Mr. Taschereau declared: "I have not been advised that such an increase in price as described in the despatch has been made. The despatch is not very clear in its terms, and I am not all sure that the conditions are accurately stated." He declined to express any further comment or to advance an opinion on the project of American industry building up a new series of mills in Alaska in order to compete against existing paper mills in various parts of the Dominion.

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Freight Rates Hearings Adjourned to October

The adjourned hearings on the application of the Canadian railroads for an increase of approximately 30 per cent in the rates on newsprint were resumed before the Board of Railway Commissioners, at Ottawa, in the latter part of June. The hearings lasted for over a week, two days being occupied by evidence for the newsprint companies, and the balance by the railways. A mass of technical evidence was presented, chiefly hypothetical rate suggestions and comparisions with existing rates all over the continent.

Next to perishable goods, the newsprint traffic receives priority over all other freight on Canadian railroads, the Board was told by traffic men of the Canadian National Railways and the Canadian Pacific Railway. Special cars are necessary for newsprint, the traffic must be speedy, and in all respects the traffic is given much priority. It is being claimed by the railroads that because of these conditions, together with the steep grades and low weather averages encountered in the districts where the newsprint mills are located, the newsprint traffic is not a paying proposition under present rates.

As the commissioners could not give the time required to complete the hearings, which will probably require another two weeks, the hearings have been adjourned to October 6th next.

Australian Preference on Canadian Newsprint Remains

Canadian newsprint will still have a preference of three pounds sterling, roughly $15, per long ton in the Australian market as against countries outside the British Empire. Under the new Australian tariff, which became effective on July 10th, the British perferential rate on newsprint is one pound sterling per ton, while the general tariff is four pounds.

According to one of the officials of the Powell River Co., Ltd., the largest Canadian exporter of newsprint to Australia, the only result of the new tariff be a reduction in the amount of newsprint consumed in Australia, but that will be relatively so small that it will not affect the pulp and paper mills on the Pacific Coast to any material extent.

For the last fiscal year Canada exported to Australia newsprint to the value of $3,790,108 and the year before $3,627,-369. Most of this came from the Pacific Coast mills. The total exports during the last fiscal year from this country to Australia was $16,322,771.

Possible Developments in the Coast Provinces

The shadow of further possible newsprint development projects still hangs over the newsprint industry, tending to obscure the future. According to present advices there is every possibility that large projects for the production of newsprint will be put into effect in the not distant future at the Atlantic and Pacific ends of the Dominion, at points from which the leading consuming centers in the United States can be reached by water transportation.

In Newfoundland, where the present newsprint mills are running at full capacity despite the depression, it is clear that the Government is determined to encourage further development to the limit. The Hon. P. J. Cashin, Minister of Finance, recently announced in his budget speech that the Anglo-Newfoundland Development Co. plans an extension to its Grand Falls mills at a cost of $1,500,000. He further announced that before the next session of the Legislature a proposition for the construction of another pulp and paper mill in the Gander Valley will be comsummated. This is taken to refer to the proposed 1,000-ton mill in connection with which the Hearst interests have been negotiating, and the confident tone in which Mr. Cashin referred to the project indicates that the negotiations have gone much further than has been generally supposed.

From Vancouver comes the announcement that three important pulp and paper interests are negotiating for an early start on large scale production in British Columbia. These are Backus-Brooks of Minneapolis, International Paper, and the Hearst publishing house. Backus-Brooks are said to be negotiating for the establishment of a large newsprint mill somewhere in the province, they having already acquired considerable pulpwood areas. These interests have developed paper mills extensively in Western Ontario, but have never before become active operators on the coast. The same is true of International Paper, which has for sometime held an interest in the Vancouver Island holdings of the old Beaver Cove Pulp and Timber Co., which a few years ago was taken over by the International Harvester Co. This deal is said to await the settlement of the general financial situation and the newsprint market, all the necessary details having been worked out sometime ago for early start of construction. This included acquisition of the waterpower site on the Nimpkish River. The interest of the Hearst group is still somewhat obscure. It is known that the big publishing house is anxious to find a source of newsprint for its newspapers at Los Angeles, San Francisco, Oakland and Seattle, and the Hearst interests have frequently been mentioned in connection with negotiations for a mill site in the Fraser River Valley.

Meanwhile, the Powell River Co. is proceeding with its $8,000,000 development program, which includes construction of a power plant at Lois River and expansion of the pulp and paper mill at Powell River. Crown Willamette Pulp and Paper Co., now associated with the Zellerbach Paper Co., has obtained the rights to the waterpower site at Campbell River, but development has been held in abeyance pending improvement in the newsprint market.

Licenses May Be Forfeited

A judgment that may affect the holding of nearly 7,000 square miles of timber lands in Newfoundland and 11,000 square miles in Labrador was handed down recently by Chief Justice Sir William Horwood at St. John's, Newfoundland, when the full bench agreed on the right of the Government to forfeit licenses held on 1,000 square miles of timber lands by George Jardine and Michael J. Martin. An action had been brought by the Attorney-General and the Department of Agriculture and Mines against the licensees.

The judgment upheld the right of the Government to forfeit the licenses due to the fact that the defendants had not complied with the terms on which they held the property. Under the terms of the license, the parties were obliged to pay $2 per square mile and a royalty of 25 cents per 1,000 feet of timber cut. They were to commence within a year and cut 100,000 feet every 24 hours, or to expend $50,000 in the erection of mills for the manufacture of pulp and paper within five years.

The defense contended that because they had paid their license fees until they were refused in November 1928, and because a former Government had waived the other conditions previous to the commencement of this action, forfeiture could not be carried out. The judgment says that "the acceptance of annual rental waived the right to forfeiture existing at the time when the rent was received, but it did nothing more. It did not compel the Minister to accept rent for the succeeding year if the breach of the conditions continued."

Thirteen parties hold licenses similar to that of Martin and Jardine involving 11,000 square miles in Labrador, while in Newfoundland there are 62 licenses covering 6,800 square miles of timber lands.

Production of newsprint in Canada during June was about 24,000 tons lower than in May. The June total, according to the figures recently published by the Newsprint Service Bureau, was 213,364 tons, as compared with 237,681 tons in the preceding month. The operating ratio of Canadian mills for June was 73 per cent of rated capacity, as compared with 75.2 per cent in May and 86.7 per cent one year ago. United States mills also operated on a slightly lower ratio in June than in May, the figures being 79.9 per cent against 80.4 per cent. The relative position of the two countries as regards production is practically the same as it was six months ago, a decline of 2 per cent being shown in the

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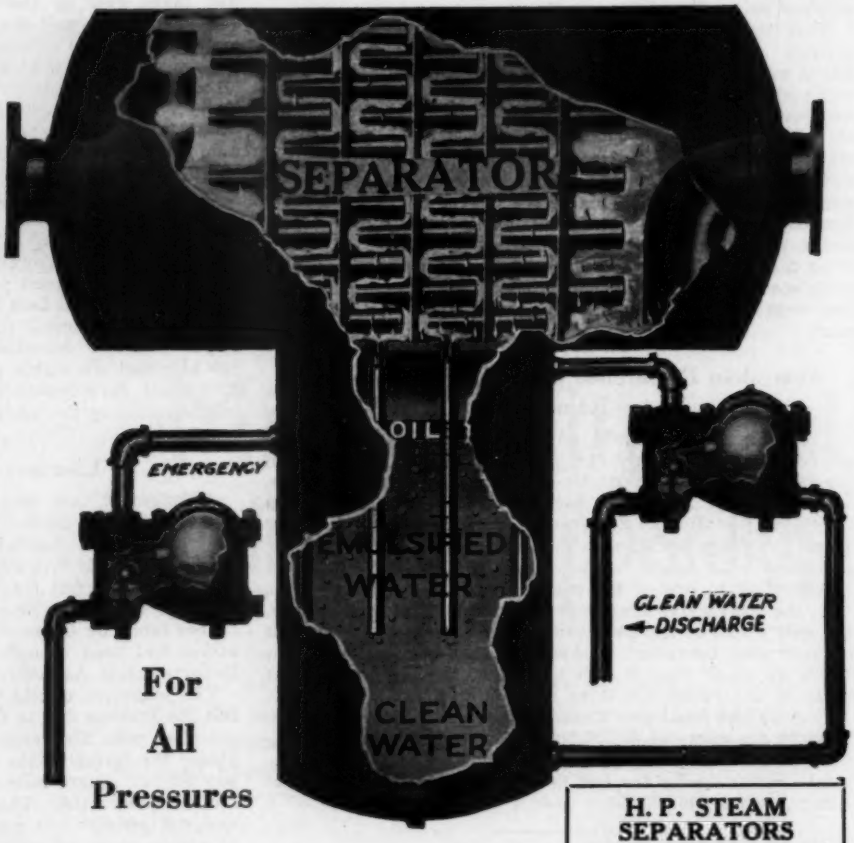

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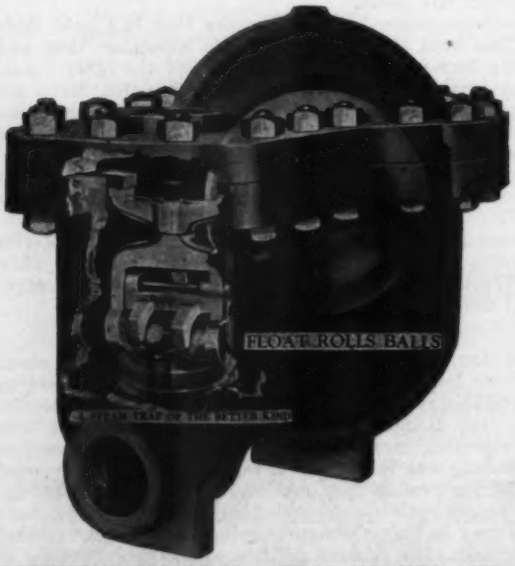

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The arrangement of tapered nozzles for speeding up the steam against the baffles . . . The counterflow action throws such elements as oil, dirt, and water out of the flow of steam and deposits them against both sides of the baffles where they cannot be picked up again by the steam and are free to drain to the separate receiving chamber.

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Canadian output and also in the United States output for the half-year ended with June, when compared with the corresponding period of last year.

The Forest Products Laboratories of Canada are making an interesting study of the behavior of lumber in transit from the Pacific Coast. The Vancouver laboratory has arranged to place in carloads of lumber consigned to Montreal and Ottawa a number of boards the moisture content of which was determined in Vancouver. Through the co-operation of eastern consignees, the Ottawa and Montreal laboratories have been checking up these moisture contents on arrival in the East to determine the change in the amount of moisture which occurs in transit.

Three officials of the English Co-operative Wholesale Society, of England, were in Canada last month seeking connections with paper mills. They were Sir William Dudley and Messrs. Wiggins and Dodds. Specifically, they wished to get lines on "off-cuts," newsprint, boards and writing papers. These gentlemen are manifestly the advance guard of English buyers who are likely to come to Canada to take advantage of the provisions of the new tariff in the way of countervailing duties upon a wide range of goods manufactured in Canada.

O. F. Bryant, the newly appointed secretary of the Technical Section of the Canadian Pulp and Paper Association, was in Montreal recently, looking his field over and arranging for an office to be equipped for his occupancy in the Association Building on University St. He presented a preliminary report to the Joint Administration Committee of the Pulp and Paper Association. Mr. Bryant, who is leaving the position of manager of the Nashwaak Pulp and Paper Co. at St. John, N. B., will assume his new duties on September 1st.

◆ QUEBEC ◆

J. H. Gundy Heads Canada Power and Paper

At a recent meeting of the directors of Canada Power and Paper Corp., George Chahoon, Jr., asked to be allowed to retire from the presidency of the corporation, and he nominated as his successor J. H. Gundy. He stated that he had been associated with the Canadian newsprint industry since its infancy and after twenty-eight years of service desired to be relieved of the office of president. Mr. Chahoon will remain as director of the corporation and an executive, and as such will devote a large part of his time to the affairs of the company. J. H. Gundy has been closely identified with the affairs of the corporation since its formation, in which he took a prominent part. His acceptance of the presidency assures an energetic continuation of the development which has already made Canada Power and Paper Corp. the largest Canadian producer of newsprint in the British Empire.

Chats Falls Power Work Progressing

Good progress is being made in the work on the development of the Chats Falls, located on the Ottawa River some 35 miles above Ottawa, which has been going on since last September. It is a joint undertaking between a private company sponsored by Montreal interests, and known as the Chats Falls Power Co., and the Ontario Hydro-Electric Power Commission. The private company secured the Quebec rights and the Hydro Commission the Ontario rights. It is planned to develop some 225,000 hp. at a cost of about $20,000,000.

Fourteen cofferdams are being constructed across the river above the falls, and the site of the power house, which will be 600 feet long and 115 feet wide, is being prepared. There are 1,200 men employed on the dam which will stretch from the Quebec to the Ontario shore, a distance of two and

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Except for the rotor shaft, the pump is made of durable close-grained iron. The steel shaft is protected by renewable brass sleeves which take the wear of the packing. Oversize ball bearings support it at each end. Bearing brackets have four heavy arms which hold the bearings rigid and in perfect alignment.

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a half miles. The big development has changed the quiet villages of Fitzroy Harbor, Ont., and Quyon, Que., into thriving centers with construction operations going on 24 hours a day. Canadian Westinghouse Manufacturing Co. has been awarded contracts in connection with this development that will amount to about $2,000,000.

The old sawmill of the St. Maurice Paper Co., located at St. Gabriel de Brandon, and a quantity of wood nearby were destroyed last month by a fire which lasted over 24 hours. The mill had not been in use for the last six years. The cause of the fire has not been ascertained.

Grand Mere Man Wins Fellowship

Making its first award of fellowships ranging up to $1,800 a year for training leaders in forestry, The Charles Lathrop Pack Forest Education Board has announced its selection of five Americans and one Canadian for the year 1930. The winning candidates were chosen from about 90 contestants. The fellowships were established to encourage men of unusual intellectual and personal qualities to obtain training that will equip them for important work, either in the general practice of forestry, in the forest industries, in the teaching of forestry, in forest research, or in the development of public forest policy.

The successful Canadian candidate is George Ritchie Lane, forester in charge of reforestation, Canada Power and Paper Corp., Grand Mere. He will make field investigations of the planting, growth, and yield of pulpwood species in the Maritime Provinces in the hope of reducing the cost of reforestation.

After an illness of about two months, Alexander O. Anderson, secretary of the James MacLaren Co., Ltd., and a prominent citizen of Ottawa, in which city he had lived for many years, died in Buckingham last month. Mr. Anderson was born at Russell, Ont., 57 years ago, but spent his early days in Ottawa, where he attended the Ottawa Collegiate Institute. On the completion of his studies, he entered the employ of James MacLaren as bookkeeper, and on the formation of the James MacLaren Co., Ltd., retained his connection with the firm in the capacity of secretary. Mr. Anderson had been with the firm at Buckingham for the past 37 years and was one of its most valued employes.

Anglo-Canadian Secures Large Order

It is reported that Lord Rothermere has placed an order for newsprint for his English newspapers with the Anglo-Canadian Pulp and Paper Mills, which will keep the mills operating to capacity for many months.

The order, it is stated, will produce more earnings for the mill than sufficient to provide for the debenture interest and dividend on the preferred stock that has been guaranteed by the Canada Power and Paper Corp., which recently bought the Anglo-Canadian properties, paying for that property with its own stock.

Much of the newsprint made by Anglo-Canadian had previously been exported to the United States. If now it is to go to England, the market for the product of other Canadian newsprint mills should be rather better.

Awards amounting to $232,500 were granted to farmers and others as a result of flooding lands along the Lièvre River in connection with the power plant for the James MacLaren Co.'s new mill at Buckingham. Thirty-four cases were covered by the latest award and twenty-four others were made a month previous. The new mill, which will have a daily capacity of 250 tons of newsprint, is expected to commence operations this month.

C. N. Candee, chief chemist of the Alliance Paper Mills at Merritton, has resigned to accept an appointment on the technical staff of the Howard Smith Paper Mills, Ltd., in the latter company's research laboratory at Montreal.

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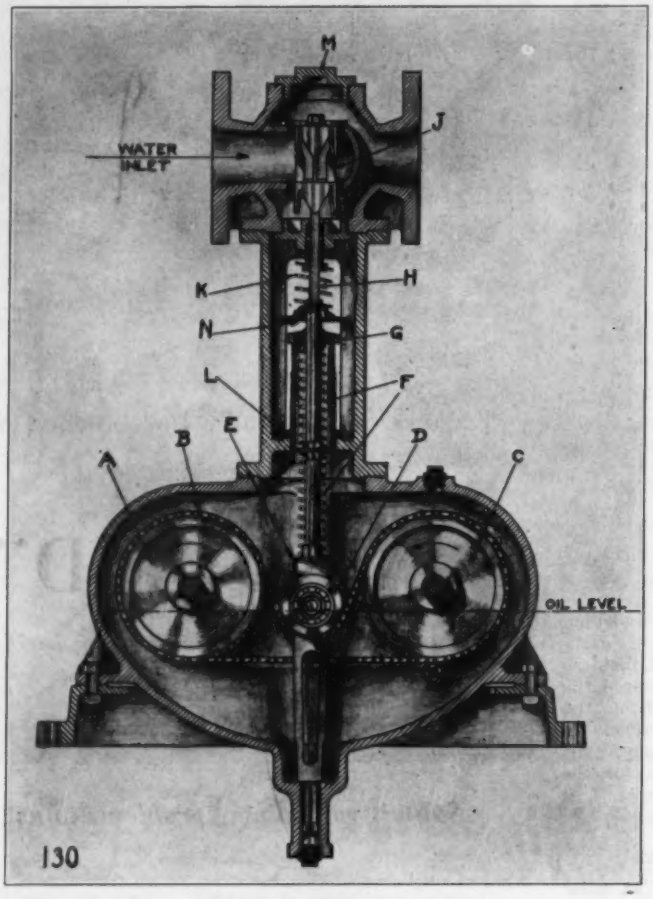

How the Regulator Works

The sprocket A, Fig. 130, is driven by a one-half horsepower motor through a worm gear. A double strand roller chain B, transmits rotation to sprocket C, which drives the agitator through a pair of bevel gears not shown. Thus sprocket A is the driver and sprocket C is driven. A roller D, rides upon the top or driving side of chain B. The roller D is carried in a floating yoke E, which is free to move up and down. A long compression spring, F, held in place under adjusting nut, G, maintains a downward pressure upon the roller D at all times. The stem, H, of water valve J rides upon the top of yoke E and is held down by valve spring K. The cut shows the positions of the various parts as they are when the machine is at rest.

When the machine is running, rotation of the agitator is resisted by its passage through the stock. This causes the chain to tighten between the two sprockets resulting in an upward force upon roller D which raises yoke E to open valve J. A lighter stock presents less resistance to agitator rotation and the reduced chain pull allows the roller and yoke to move downward under pressure of spring F, thus reducing the valve opening.

It will be readily seen that this arrangement is one of great simplicity and effectiveness. The agitator with its 80 sq. inches of blade area turning at 60 RPM, **vigorously attacks the stock**, breaking up any lumps and **quickly mixing** the regulating water.

Consistency Regulation on 2½ to 7% Stocks

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Accurate Control High Consistency Stocks

Various Stocks— Metered In or Out of Beaters

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Canipco News

Irwin W. Copeland, formerly of Glens Falls, N. Y., and for the last two years employed at the Three-Rivers mill of Canadian International Paper Co., has been promoted to the position of acting manager of the mill, succeeding C. W. Walker, who has become manager of the three newsprint mills of the company in Canada. Mr. Copeland first became connected with the paper business when he was employed at the Finch Pruyn plant in Glens Falls. Later he went with the New York Times mill at Tidewater, after which he was associated with the Abitibi Power and Paper Co.'s plant at Murray Bay.

Damage estimated at $50,000 was caused by a fire which destroyed the fiber board plant of International Fibreboard Co., an International Paper subsidiary, at Gatineau last month. The flames raged for three hours before being brought under control by the volunteer fire brigade of the plant. The loss is covered by insurance. The building was a one-story, brick construction, with tarred roof, and contained a press for making fiber board, and was also used as a storehouse for surplus stock. A kiln was also in operation in the plant, and it is believed to have ignited the fiber board piled beside it.

The Buckingham Power Co. has been incorporated to take over the hydroelectric development on the Lièvre River in connection with the James MacLaren newsprint mill at present nearing completion near Buckingham. The capital stock of the company is to consist of 250,000 shares of no par value.

The erection of a hydraulic power plant at Chute à Caron, on the Saguenay River, by the Alcoa Power Co. got under way on July 23, when a huge concrete block, 90 feet in length and 30 feet in depth, was sunk to keep the waters from the falls from interfering with the foundation work. The feat of sinking this block was considered by engineers to be epoch-making in this phase of engineering work.

ONTARIO

Co-operation Between Forest Industries and Government

Hon. William Finlayson, Minister of Lands and Forests for Ontario, in a recent interview regarding the progress of the pulp and lumber industries, said: "Legislation has been passed from time to time as the need became apparent, to meet current demands and to safeguard as far as possible Ontario's heritage of forest wealth. During the last session of the Ontario Legislature an amendment to the Crown Timber Act was passed with a view to suspending the 'Manufacturing Clause' insofar as poplar is concerned. In view of the fact that this class of material is so prolific in growth and so widespread throughout the forest areas of Ontario, and unless cut during its early years depreciates in quality, provision should be made for its export inasmuch as the Canadian market for it is limited. This, however, affects only the pulp and paper industry as distinct from the lumber industry. Legislation was also passed whereunder new areas were specifically designated as Provincial Forests under the control of a technical forester for the purpose of preserving them according to the best forestry practice and to bring them eventually under a sustained yield basis. Sympathetic co-operation between the Government and the operators has been so effective within the last few years that the old barriers of individual prejudice and attempts to bleed the forests, which kept the State and the operator apart, are almost entirely broken down. The old practical idea has given way in part to the technical, and the latter in turn to the former, each recognizing that the practical and theoretical can be made to harmonize to the economic advantage of both."

Eight 14 ft. Biggs Rotary Digesters, with special worm and segment drive, built and erected for the Celotex Company, New Orleans. This installation rounds out a total of 16 Biggs globe rotary digesters in the Celotex plant. This and many other interesting views appear in "Unusual Steel Plate Construction", a photographic folder which will be gladly mailed you.

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That has been a common happening in Biggs' more than 40 years' experience. Perhaps you have some difficult situation pertaining to welded or riveted rotaries or digesters, stationary or tumbling. See if Biggs hasn't the answer all ready for you.

Biggs All-Welded Rotary Digesters are making a splendid name for themselves through their practical elimination of maintenance costs. Paper manufacturers have found that Biggs Welded Rotaries end *all* the troubles formerly encountered in chestnut chip and similar special processes.

The important insurance companies all accept Biggs electrically welded pressure vessels without limitation as to size or working pressure. The Biggs weld is "*stronger than the plate itself.*" May we send you a copy of "Unusual Steel Plate Construction"?

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for the Paper Industry

Welded Globe Rotary Digesters
Riveted Globe Rotary Digesters
Cylinder Rotary Bleaching Boilers
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Penstocks; Welded or Riveted Steel Plate Construction of Every Description

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For the small building we offer several sizes of the new Breezo-Fin Model "B" Heater,—compact, light weight, easy to hang from wall or ceiling, good looking.

For the larger buildings Buffalo Highboy and Lowboy Heaters, available in many arrangements for floor, wall or ceiling installation. Efficient, positive distribution. Pleasing paneled casing. Interchangeable and accessible construction.

For the man who wants cleaner air,—the Buffalo Wetboy—a unit that washes the air before it is heated.

For the shop without steam or where gas is reasonable in cost—The new Buffalo Gas Heater—compact, efficient, fool-proof automatic controls—low first cost. A complete heating plant without auxiliaries.

Let our engineers make unbiased recommendations. It costs less in the long run.

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"Buffalo" Unit Heaters
—steam and gas—
for every requirement

Further drastic action to deal with alleged incendiary bush fires was taken by the Ontario Government when it passed an order-in-council authorizing a reward of $100 for information leading to the conviction of persons setting fire contrary to the provisions of the Forest Fires Prevention Act. While the reward will apply to all sections of the province, it is aimed more directly, it is understood, at the Head of the Lakes district, where a number of the recent serious forest fires are suspected by Government operatives to have been touched off by jobless settlers seeking employment with the Forestry Branch's fire-fighting crews.

A rather interesting prediction was made recently by a lumberman who envisages all publicly owned timber lands in Ontario being managed by a body such as the Hydro-Electric Power Commission. He declared his firm conviction that force of circumstances would bring about a change in the policy of handling forest resources. He contended that conditions in the lumber business had not been good in the last few years and it was his view that the Government would be compelled to step in to save the industry. The situation had been such that many small operators had not made more than a bare living and others had been forced out of business.

Another point stressed was that, whereas it was formerly believed that private ownership was more efficient than public ownership, the example of the Hydro-Electric Power Commission had dispelled this idea. He pointed out that the Hydro had shown what can be done under proper supervision and if there is no interference from political quarters. He said that, since the forests belong to the people of Ontario, and not to the men who lease the limits, the public welfare should be the first consideration.

Dealing with the situation in Quebec, it was his opinion that, although the Taschereau Government is against public ownership, it would be compelled to follow suit if Ontario handled its forests through a Commission. The situation in the pulp and paper industry has reached a point where there are virtually only two big corporations to deal with, the Abitibi company in Ontario and International Paper in Quebec. The drift of the times in this phase of the country's life is distinctly toward the administration of the forest products on the basis of public ownership.

Abitibi News

J. H. Black has resigned his position as vice-president and general manager of the Spruce Falls Power and Paper Co., and has joined the Abitibi Power and Paper Co. He has been appointed assistant to the president with special jurisdiction over waterpower development. Mr. Black is widely known in paper circles in Canada, and is a director of many important Canadian corporations. He is an ex-railway operator and for twelve years was general manager of the Northern Canada Power Corp. For eight years he was managing director of the Excelsior Life Insurance Co.

John Sutherland, superintendent of the electrical works at the Sturgeon Falls division of Abitibi, recently had the misfortune to fall from the stage of the local theatre while attending a public meeting. His head striking the railing around the orchestra pit, he sustained a severe scalp wound which rendered him unconscious and necessitated his removal to the hospital.

A. W. Gall has been appointed office manager of the Toronto office of the Abitibi organization, succeeding in that post to L. B. Popham, who has been appointed assistant secretary of the company.

As a result of the departure of J. H. Black, who has resigned the position of general manager of the Spruce Falls Power and Paper Co. to join the Abitibi organization, Egerton S. Noble, manager of the company's mill at Kapuskasing, has been appointed to succeed Mr. Black as general manager. Alfred Barber has been appointed treasurer of the company and has also been elected to fill the vacancy on the board of directors caused by Mr. Black's resignation. W. E. Lavan, formerly secretary to Mr. Noble, has been appointed to succeed him as mill manager at Kapuskasing.

BEFORE

bearings fail!

In most instances bearing failures may be traced directly to the use of improper lubricants which failed to prevent metal-to-metal contact and which did not provide the necessary lubricity.

In the case of anti-friction bearings, incorrect lubrication results in etching of the highly polished surface, flaking of rollers, and abrasion of stay bars and end rings.

Houghton's Absorbed Oils are now recognized as the most satisfactory bearing lubricants it is possible to manufacture. They consist of two oils in one. A film base which prevents metal-to-metal contact and abrasion. Into this base is absorbed a special lubricity oil which provides the necessary "slipperiness" and allows the transmission of power with the least loss due to friction.

Houghton's Absorbed Oils "stay-put" in the bearings at all times. They prolong life, save power and increase production.

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BEFORE bearings fail!

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...TO MEET EVERY FURNACE CONDITION

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4676

Printers to Co-operate with Research Foundation

The Toronto Typothetae went on record at its annual meeting sometime ago as favoring the establishment of a printing section as part of the Research Foundation of Ontario, and it is likely that an expenditure of about $10,000 annually will be sanctioned after the special committee further investigates the proposition.

A number of paper merchants were present at the meeting and the representative of one big publishing house declared that his firm had been enabled to save a large amount of money annually by applying scientific research to paper-using problems. Leonard T. Acton, one of the executives of the Acton Publishing Co., Toronto, was elected president of the Typothetae for the ensuing term.

The judgment of the Appellate Division of Ontario was confirmed by the Judicial Committee of the Privy Council, last month, in the Lake of the Woods water diversion case. Their Lordships dismissed the appeal of the Keewatin Power Co., in which the Lake of the Woods Milling Co. and the Keewatin Flour Mills Co. were respondents. The power company had sought to prove there was wrongful diversion of water.

An interesting feature in connection with the new mill of the Insulate Co. of Finland is that the grinders were made by the Carthage Machine Co., of Belleville, Ont. The Insulite Co. is a subsidiary of the Backus company which has several large paper mills in Canada, at Ford Frances, Kenora and Fort William. The grinders are being shipped to Karhula, Finland, the company having built considerable other machinery for mills in Finland.

The Quinte and Trent Valley Power Co., which is controlled by the Canadian Paperboard Co., has passed the dividend on its preferred stock of which about $350,000 is outstanding. The company supplied power to the Frankford mill of the Canadian Paperboard Co., and to the town of Frankford. Recently, however, the mill at Frankford was closed down in view of conditions in the board market, and this has had its effect upon the power company. The latter is endeavoring to dispose of its power in other directions and will probably experience little difficulty in finding new customers.

The new motor vessel Thorold recently landed its first cargo of newsprint at Chicago. The Thorold was specially built for carrying newsprint from the Ontario Paper Co.'s mill at Thorold to the Chicago Tribune, and her first cargo consisted of over 2,000 tons of paper.

◆ MANITOBA ◆

Northern Pulpwood Resources to Be Utilized

Large pulpwood reserves in northern Manitoba and Saskatchewan have recently been surveyed and reports indicate that English and American capitalists are much interested in the development of these resources. Already the pulp and paper industry has made a start in more southern regions of Manitoba and now there are prospects that White Mud Falls on the Nelson River will be harnessed to supply power for papermaking.

Extensive surveys have already been made by the Federal Government on timber berths along the Nelson River basin. It is generally understood that development of these resources will be economically possible within a very short period. Across the boundary, in Saskatchewan, a survey of pulpwood resources has been ordered by Hon. J. A. Merkley, Minister of Industries at Regina. Standing timber, location, transportation facilities and water supply will be reported on.

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Is your water supply properly protected to insure highly efficient mill operation and the highest quality in your product? Hungerford & Terry Engineers will investigate your conditions and report to you fully without obligation.

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At Olympic Forest Products Company Boiler Settings Are Laid Up With ADAMANT-ADACHROME *Fines*

IN the new bleached sulphite pulp mill of Olympic Forest Products Company at Port Angeles, Washington, ADAMANT Fire Brick Cement and ADACHROME *Fines* were used to lay up the fire brick in the settings under the three Babcock & Wilcox Sterling type water tube boilers. Approximately 90 tons of ADAMANT-ADACHROME *Fines* were used in this installation.

ADAMANT Fire Brick Cement is the original high temperature refractory cement. It is shipped in plastic form, ready-mixed and ready for use. Of itself, ADAMANT is the ideal bond for fire brick, but where service conditions are particularly severe, Mixtures of ADAMANT-ADACHROME *Fines* are used. ADACHROME *Fines* is a carefully prepared chromite material which is chemically neutral, hard and dense, and possesses exceptional refractoriness.

Mixtures of ADAMANT-ADACHROME *Fines* make strong, air-setting fire brick joints that are highly resistant to excessive temperatures, to the cutting and swirling action set up by hog fuel in combustion, to abrasion and other destructive elements encountered in Dutch ovens, boiler furnaces and refuse burners.

A few of the Prominent Northwest Pulp and Paper Mills using ADAMANT *Fire Brick Cement and other* ADAPRODUCTS

Grays Harbor Pulp & Paper Co. *Hoquiam, Wash.*
National Paper Products Co. *Port Townsend, Wash.*
Pacific Mills, Ltd. *Ocean Falls, B. C.*
Rainier Pulp & Paper Co. *Shelton, Wash.*
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In leading plants of the Northwest, service has proved the superiority of ADAMANT Fire Brick Cement, Mixtures of ADAMANT-ADACHROME *Fines* and other ADAPRODUCTS. Your refractories construction, too, will benefit through the use of ADAPRODUCTS. May our factory representative tell you why? Write directly to us, or to the distributor near you.

BOTFIELD REFRACTORIES CO., *Swanson and Clymer Sts.*, PHILADELPHIA, PA.
WORLD'S LARGEST EXCLUSIVE MANUFACTURERS OF HIGH TEMPERATURE CEMENTS

ADAMANT FIRE BRICK CEMENT

Other ADAPRODUCTS *Include*

ADACHROME *Plastic Super-Cement* ADACHROME *Fines*
ADACHROME *Aggregate* ADAPATCH (*fire brick in plastic form*)
The ADAMANT *Gun* *Write for Booklet*

❖ NEW BRUNSWICK ❖

Bathurst Reports Reduced Earnings

The continuance of unsatisfactory conditions in the newsprint industry is mentioned by Brigadier-General J. B. White, president of Bathurst Power and Paper Co., Ltd., in his report to shareholders for the fiscal year ended December 31, 1929, in connection with the reduced earnings shown by the company for that period. Operating profits for the year were $281,550, as against $411,781 in 1928. Bond interest, other interest and organization expenses were items appearing in 1928 which do not occur in the present statement, and hence the only deduction from the operating profit shown, which was after provision for depletion of timber limits, is $200,000 provision for depreciation, leaving a net profit of $81,550, against $126,748 in the preceding year. Payment of $100,000 in dividends left a debit balance in the year of $18,450, and on a previous surplus being brought forward at $121,748, there is a net profit and loss balance of $103,298.

At the annual general meeting of the company, the same board of directors was re-elected, as follows: Brig.-Gen. J. B. White, A. J. Nesbitt, P. A. Thomson, G. H. Montgomery, H. J. Webb, A. E. McLean, J. B. Woodyatt. After the annual meeting the following officers were elected at a directors' meeting: president, Brig.-Gen. J. B. White; vice-presidents, A. E. McLean and H. J. Webb; Treasurer, H. J. Webb; assistant treasurer, Geo. A. Schryer; secretary, S. B. Bond.

A $10,000 check signed by Neil C. Nead, assistant to the president of the International Paper Co., has been received by the University of New Brunswick to be used in equipping the new forestry building of the school. This is the second contribution received by the University's forestry school, Price Bros., of Quebec, having contributed $5,000.

New Brunswick this year is enjoying a fourth successive year of exceptional growth in her forests, which are recovering steadily from the inroads of the spruce bud worm which up to 1925 had been serious. A survey of the forest increment since last year is now being made by the Provincial Forest Service, which has a party of University of New Brunswick undergraduates at work in the Miramichi River watershed.

V. H. Emory, formerly chief chemist of the Canada Paper Co., at Windsor Mills, Que., has accepted a position on the Technical Sales Staff of Fraser Companies.

According to a press report, negotiations are said to be well advanced for the acquisition of Fraser Companies by one of the larger companies. The building program undertaken by the Fraser Companies has now been rounded out by the coming into operation of the sulphite mill at Athol. A year or so ago the Fraser Companies and International Paper entered into a deal for the purchase of the Snowball timber limits.

Archibald Fraser, president of Fraser Companies, was married in London, England, on June 25 last. After a trip to France and Scotland, Mr. and Mrs. Fraser returned to Edmundston, where they will take up their residence.

In connection with the doubling of the capacity of the Dalhousie mill of New Brunswick International Paper Co., the Canadian General Electric Co. is supplying the six 2,000 hp. grinder-motors to drive the twelve additional magazine grinders which will be required for the production of groundwood to feed the two new newsprint machines which are to be installed.

Seventeen of the larger paper makers who put one or two Warren pumps in *on trial* have consistently placed repeat orders until their total now stands at 663 pumps. More than 69% of the mills that have installed Warren centrifugals for paper mill service, have placed repeat orders . . . *proof of dependable, low cost pumping.*

Battery of 12 Warren Stuff Pumps in a large mid-western mill. 2 pumps were put in *on trial*, 177 are now in daily operation in this and other mills owned by the same company.

At a time when profits depend upon low production costs, you cannot afford to overlook the advantages to be gained by using Warren Pumps for every pulp and paper mill service. Bulletins or estimates?

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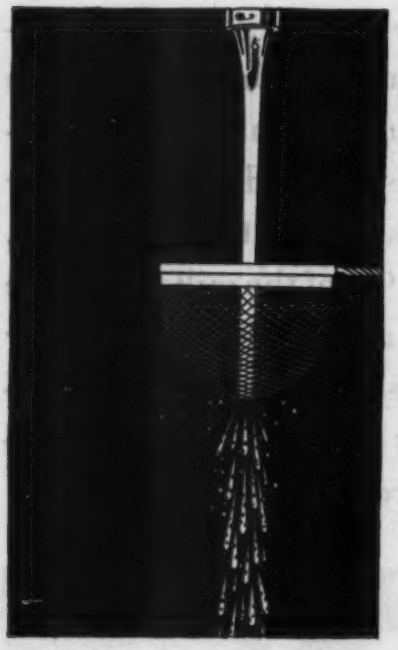

KENWOOD TANNED FELTS HAVE THE OPENNESS FOR UTMOST WATER REMOVAL

Through an entirely new method of yarn construction that neither adds weight nor bulk to the yarn, the modern Kenwood Tanned Felt affords greater openness and increased strength which, in the final analysis, means lower felt cost per ton. These advantages, combined with the well known properties of longer felt life, smoother surface and utter dependability of Kenwood Tanned Felts, place them in a definitely higher class.

Kenwood pioneered the one sided board felt. Kenwood research developed and perfected the patented Kenwood tanning processes which protect the felt from the weakening of acids in the water. This third major development—improved yarn construction — is the natural result of the progressive, scientific development that has always marked the manufacture of Kenwood Felts.

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WOOL PRODUCTS

◆ BRITISH COLUMBIA ◆

New Westminster Mill Officially Opened

The new plant of the Westminster Paper Co., at New Westminster, has now been completed and was recently opened with all due ceremony. The occasion was an important milestone in the industrial history of New Westminster, and more than 500 of the civic officials and leading citizens of the Royal City, Vancouver, and other points, were the guests of the paper company. All the speakers and guests paid tribute to the courage and initiative of the directorate in re-establishing the plant on an even bigger scale after the disastrous fire which completely gutted it in July, 1929.

Hon. R. L. Maitland, K. C., representing the British Columbia Government, formally declared the new plant open, and gave the signal for the whistle to blow. Acting Mayor F. J. Hume, representing the city of New Westminster, presided as chairman and introduced the speakers. J. J. Herb, president of the company and prime mover in the enterprise, was the host, and was also the "guest of honor" of the shareholders. A touching tribute to the efforts of Mr. Herb was revealed when Mr. Maitland, on behalf of 100 old employees of the firm, presented the president with a handsome desk lamp as a token of their affection. This gesture from the loyal workers greatly affected Mr. Herb, who stated that, while he appreciated all the compliments which had been paid him that day, he valued this tribute most of all.

Australia, which, before the fire of a year ago, was a good customer of the Westminster Paper Co., will be among the first markets to receive supplies from the new mill. An advance shipment of a large order left Vancouver sometime ago on the liner Niagara for the southern dominion, and with it went a shipment for Suva in the Fiji Islands. The Australian order consisted chiefly of wrapping paper, paper napkins and paper towels, while the shipment to Suva was principally of toilet tissue. Several carloads have already been shipped since the new plant commenced operations. Toronto and Winnipeg being among the eastern and prairie centers receiving the products of the New Westminster plant.

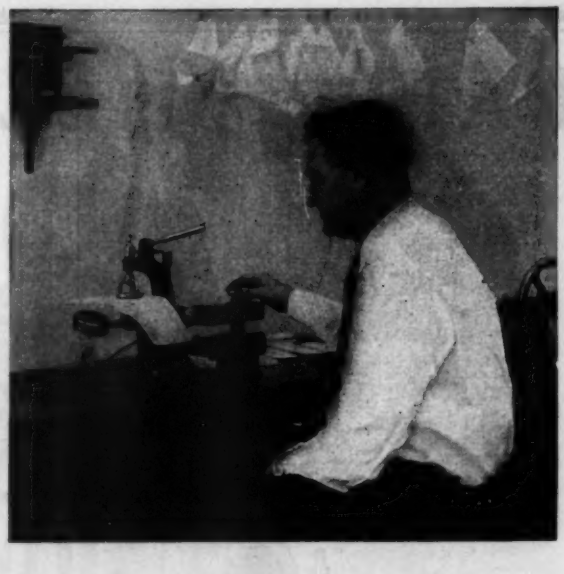
To Increase Utilization of Hemlock

Experiments are being carried on at the University of British Columbia with a view to establishing a process that will make it possible to utilize 90 per cent hemlock in the manufacture of newsprint. If these experiments are successful, the production of pulp and paper in British Columbia will be revolutionized in the opinion of practical paper men. At present about 40 per cent spruce, 40 per cent hemlock and 20 per cent balsam and larch are being used in the manufacture of newsprint. The growing scarcity of spruce, except in closely specified areas, will act as a barrier to future large scale newsprint expansion, in the opinion of paper manufacturers, unless some means is found of using a smaller proportion of this species in newsprint manufacture.

The established pulp and paper concerns such as Powell River and Pacific Mills, Canadian subsidiary of the Crown-Zellerbach Corp., are well supplied with spruce, but the stands of spruce readily accessible to mill sites, and which are now under control, are relatively not extensive. There are, on the other hand, vast stretches of hemlock timber which, under present conditions, find only a restricted market. Hemlock would be an asset of prime importance in future development of the industry if a practical means of utilizing it could be found.

Rate of Growth Being Studied

An important experiment, which may prove vital to the very existence of the British Columbia logging and subsidiary industries, is to be conducted this summer in British Columbia under the direction of the Dominion Forestry



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Accurately spaced wires maintain uniform drainage over the entire surface of the machine.

They assure a sheet of equal thickness throughout, together with uniform strength, and a smooth surface!

Safeguard the quality of your paper by "making" it on smooth-running, uniform Tyler Fourdrinier Wire!

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Tyler Fourdrinier Wires are an important factor in producing the high quality paper turned out by many of the country's leading mills—it will pay you to investigate!

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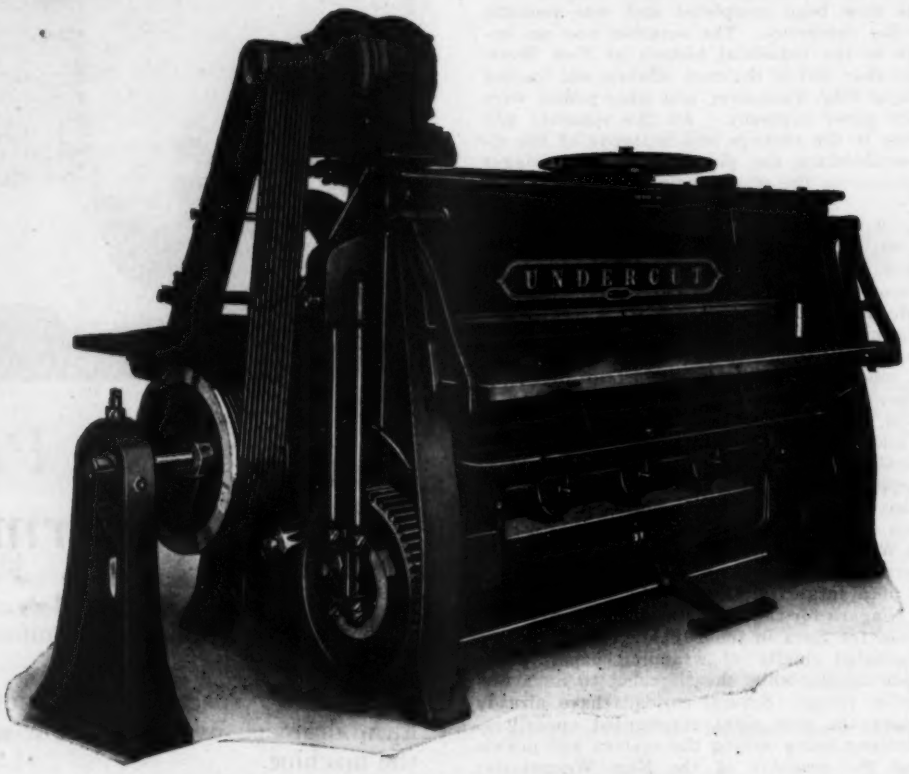

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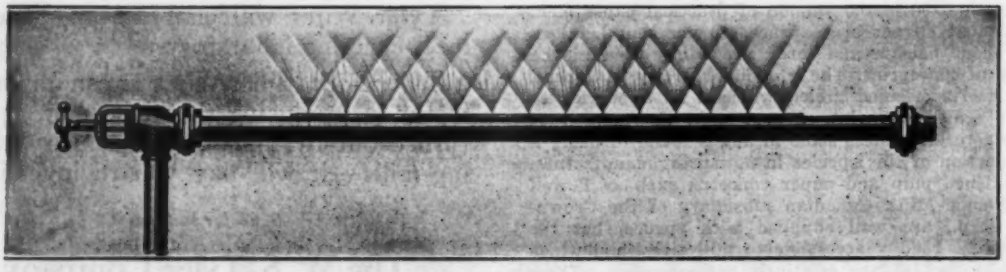
One of our high efficiency products universally adopted by leading paper mills.

For over a century we have been building paper mill machinery and the accumulated experience gained in our 100 years of service to pulp and paper mill men is yours for the asking—no obligation.



The Rain Storm Shower Pipe

The Smith & Winchester Mfg. Co.

ESTABLISHED 1828

South Windham, Conn.

PAPER MACHINERY—PAPER CUTTERS—PAPER BAG MACHINERY

Branch. This experiment involves the study of the natural growth of timber to ascertain whether the annual natural growth offsets the annual logging and fire losses. The net result will show whether the timber supply will be perpetual, or whether it is melting away every year as some reports indicate.

E. Saunders and P. Ryan, of the forest service, have left their office in New Westminster with two gangs of men to pursue this study in northern points of the province. One of the observations will be made in the vicinity of the pulp and paper district at Ocean Falls, and another survey will be made on the east coast of Vancouver Island. The age and growth of trees will be measured by means of a special boring device which will cut out a small core to the center of the tree.

Report Progress on Power Project

The first stage in the construction program by British Columbia Power Corp. of the huge power development at Bridge River has just been completed by the "breaking through" of the Bridge River tunnel, which has been in the process of boring for the past two and a half years. Completed at a cost of $1,750,000, over two and a half miles in length and 16 feet in diameter, the tunnel is part of the Bridge River hydroelectric development 150 miles north of Vancouver.

The purpose of the tunnel is to divert the water of Bridge River, a tributary of the Fraser River, into Seton Lake which is two and a half miles away and lies 1,200 feet below the river level. The tunnel pierces Mission Mountain. Water from the tunnel will flow down the penstocks on the Seton slope into the water wheels of the power house, which will be located on the lake shore.

The tunnel will convey sufficient water to develop 216,000 hp. Ultimately another tunnel will be bored parallel to the first, raising the capacity of the power plant to over half a million horsepower. The first unit of the Bridge River power plant will have a capacity of 54,000 hp. and will cost $14,000,000. It is expected that this unit will start to deliver power by the end of 1932.

◆ SASKATCHEWAN ◆

Large Power Development Proposed

A proposal by interests of eastern Canada and the United States for the expenditure of $4,500,000 on construction of a power project at what is known as the Horshoe Bend on the Saskatchewan River, is under consideration by the Saskatchewan Government. The site of the proposed development, which would produce power for distribution throughout the province, is 35 miles east of Prince Albert.

It is said that the Fraser-Brace Engineering Co. of Montreal and Rollins and Sons of Boston are interested. It is considered development of northern Saskatchewan's pulpwood resources would follow completion of the project.

Pomilio Process Mill in Argentina

At San Juan Ortiz, near Rosario, Argentina, a mill for making straw and flax paper is being built under the supervision of Umberto Pomilio, who is known as the inventor of a chlorine process for pulping cereal and other straws. The enterprise is being financed by the Cellulose Argentina Company and is expected to be ready for operation in November. Writing, packing and wall papers will be made at the start and the mill will have a capacity of 8,000 tons.

On the afternoon of July 30, the Hercules Powder Company, Wilmington, Del., held fitting ceremonies, the occasion being the laying of cornerstone of the main building of its new experimental and research laboratories. The laboratories are being moved from Kenvil, N. J. to the new location at Hercules, Del., three miles west of Wilmington in order to be nearer the main office and to provide new facilities.

Here's a booklet you should have!

. . . based on many years practical experience saving money for paper mills.

Every mill superintendent should have it in his files because it points the way to economies wherever there is cleaning to be done, such as cleaning fourdrinier wires, washing felts, screens, and other mill equipment.

Tell us your problems or drop us a post card and this 12 page booklet containing directions and formulas for cleaning the Oakite way will be mailed without cost or obligation.

Oakite Service Men, cleaning specialists, are located in the leading industrial centers of the United States and Canada

Manufactured only by
OAKITE PRODUCTS, INC., 16A Thames St., NEW YORK, N. Y.

OAKITE
TRADE MARK REG. U.S. PAT. OFF.
Industrial Cleaning Materials and Methods

FARREL-BIRMINGHAM COMPANY INC.
40 State St., Ansonia, Conn.

PAPER MILL MACHINERY:

Paper and Board Calenders—Chilled Iron Rolls for Various purposes—Roll Grinders, Roll Calipers—Coating, Saturating, Silicating, Parafining, and Waxing Machines—Hydraulic Pulp Dehydrating Presses, Calender Roll Recovering Presses. See MECHANICAL CATALOGUE, A. S. M. E.

Roll Grinding Machines: Two-Wheel Roll Grinding Machines with swing rest and cam type crowning device always produce an absolutely accurate and correct shape; noted for efficiency and low-grinding costs. List of installations on request, with sizes and specifications.

NEW RECORDS FOR PRODUCTION AND PRECISION ARE MADE ON FARREL-BIRMINGHAM MACHINES

SINCE 1873

Supreme

The superior finishing qualities of Perkins Calender Rolls are the natural result of the longest and broadest experience in this highly specialized manufacture.

The Perkins roll shop is the largest in the world.

The Perkins organization is always prepared to build your rolls to meet exactly your production requirements.

Refills and remakes include the rolls of any manufacture, domestic or foreign, for any application in the paper industry.

No CALENDER *can be better than the* ROLLS *in it*

B. F. Perkins & Son, Inc., Holyoke, Mass.

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Cotton Rolls
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Mullen Paper Testers
Tensile Testers
Ventilating Fans
Rag Cutters
Stock Cutters
Paper Dampeners
Bleach Ejectors

◆ NEW ENGLAND ◆

A. W. P. Shows Increase First Half of Year

An increase of $13,331.74 in net earnings during the first six months of 1930, compared with the same period of 1929, is shown by the financial statement of the American Writing Paper Company, Inc., just released. This increase in earnings was effected with a sales volume for the first half of this year 10 per cent below sales for the first six months of 1929, the report shows.

The company's net earnings for the first half of 1930 totalled $248,512.50, compared with $235,180.76 for the same period of 1929.

The balance sheet as of June 30, 1930, shows that the company's current assets are 8.27 times current liabilities. In the first six months of 1930 the company earned in excess of the dividend requirements on preferred stock thirty-seven cents per share on the outstanding shares of common stock.

"In most businesses," states Sidney L. Willson, president of the American Writing Paper Company, Inc., in commenting on the statement, "it will be found that from 60 per cent to 75 per cent of the profits of 1929 were earned in the first six months. For the calendar year 1928 the net earnings of the American Writing Paper Company, Inc. were $278,000, representing an average of $23,000 monthly; in 1929 the net earnings were $364,432.91, an average of approximately $30,000 per month over the year. The company's net earnings for the first six months of 1930 of $248,512.50 represent an average of about $41,000.

"This increase in monthly earnings in 1930 has been accomplished on sales 10 per cent less in volume compared with the same period of 1929, and under less favorable business conditions, but has resulted from concentration of product into fewer mills, higher efficiency in operations and administration and the increased sales of less competitive grades of paper."

Mr. Willson states that during the first six months of 1930 there has been a recognized depression in business of approximately 15 per cent below the average for the calendar year 1929, and approximately 10 per cent below the average for the last six months of 1929. Therefore, in a comparison of the first six months of 1930 with the corresponding period of 1929, due allowance should be made for the difference in business conditions existing during the two periods.

"In my opinion," says Mr. Willson, "the bottom of our business depression has been reached, and I believe a gradual improvement will materialize and continue into 1931, when the average volume of business will be reached and maintained for a considerable period."

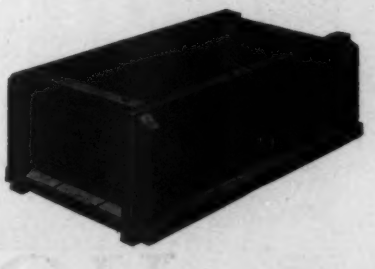
Eastern Made Good Showing

American Writing Paper Co., is not the only New England paper manufacturer to report an excellent first half earning condition. Eastern Manufacturing Co., at Bangor and South Brewer, Me., had a net for that period of $547,116 which compared with $598,000 net for the first half of 1928; this is somewhat less, relatively, and taking into account the business depression it can be considered a real gain. Both these years, however, compare with a deficit in 1927. The reason a 1929 showing is not announced is because certain changes in the company last year do not make them available although a profit was earned. The present figures include Orono Pulp & Paper Co., taken over in January. The company expects even better results from second half operations.

The Eastern management looks at the future of the industry somewhat more optimistically than has become fashionable in certain quarters where overproduction is seen in everything. Progress in the reduction of manufacturing costs is regarded as a great boon to the industry, and the management of Eastern considers it a very general trend.

The two mills of the Hollingsworth & Vose Co., at East Walpole and West Groton, Mass., are today capable of pro-

WOOD TANKS



We are equipped to build any kind of a wood tank. Specializing in Cypress and Redwood, we also make a great many tanks of Western Fir, Cedar, Eastern White Pine, Oak, Long leaf Yellow Pine and other woods. Every Stearns Tank is manufactured in our own modern tank factory by experienced men.

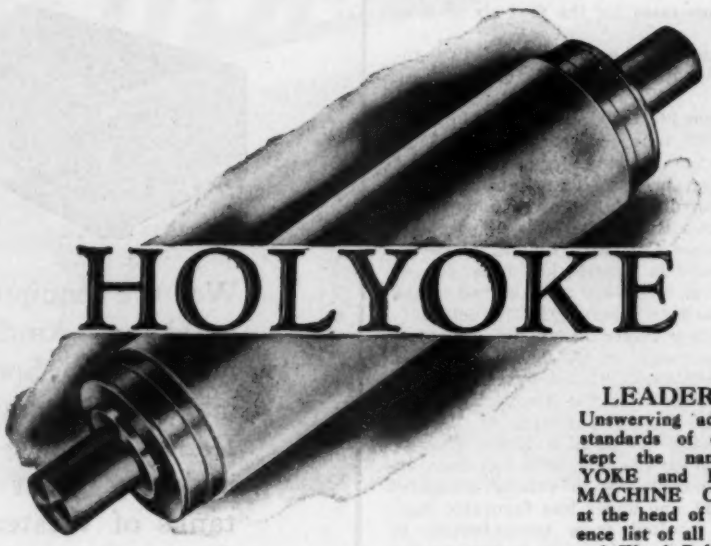
A Stearns Tank is a Long Life Tank because it is built of the right kind of wood for the specific use it is to be put to.

Let our engineering department help you.

The A. T. Stearns Lumber Co.
Neponset, Boston, Mass.
STEARNS TANKS

PIONEERS SINCE 1863 IN THE MANUFACTURE OF PAPER MILL AND WOOD PULP MACHINERY

RESILIENT



HOLYOKE

LEADERSHIP
Unswerving adherence to standards of quality has kept the names HOLYOKE and HOLYOKE MACHINE COMPANY at the head of the preference list of all good Paper and Wood Pulp manufacturers.

ALL HOLYOKE Cotton and Paper Rolls are *Resilient*,—to just the right degree. The long experience of HOLYOKE Engineers makes it possible to attain *uniform* resiliency. This in turn helps to assure a higher quality paper of whatever grade you are running,—uniform in finish throughout.

Write HOLYOKE MACHINE COMPANY, Holyoke, Mass., Manufacturers of Super Calenders, Platers, Cotton and Paper Rolls, Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors.

The HOLYOKE MACHINE COMPANY

FOUNDED 1863

ducing 140,000 pounds of rope and jute paper a day since the completion of the company's new 120-inch cylinder machine. The company has printed an attractive little booklet outlining its history and that of the rope paper industry in connection with the Massachusetts Bay tercentenary.

Traffic News

The full benefits of stop off in transit are now assured to New England paper manufacturers as the completion of the series of tariffs outlining and announcing that privilege by the important originating carriers gives assurance that the privilege will be in working order by September. The Boston & Maine R. R. as previously announced had already granted this right to paper manufacturers or other shippers of paper; the Maine Central R. R. followed suit but both carriers established the system for cars loaded and stopped off on their own lines only. The Boston & Maine R. R. now announces a tariff to go into effect on August 30 next which will accord stop off for completion of loading for cars started on the Maine Central and Grand Trunk railroads.

The same regulations will govern, a $10 per car charge the carload rate from originating point of the movement and 24 hours for the stop off. Any destination west of the Hudson or in New England may be used. Merchants in the west who have followed the progress of the negotiations, can now be assured that their purchases from two mills can be clubbed at the carload rate in this manner and will open up important markets. The New England Paper & Pulp Traffic Association instigated the development.

Several other transportation items of news came to a head during the past month in this territory. Recognition of motor truck competition by the New Haven R. R. caused it to permit the loading of metal fasteners, roofing caps or nails not to exceed ten per cent of the shipment at Millis, Mass.

Several commodity rates were cancelled. The Central Vermont R. R. announced the cancellation of a 32c rate on paper board of various types from Bellows Falls, Vt., to Three Rivers, Quebec, and the establishment of a combination rate. A rate of 17½c on wood pulp also from Bellows Falls to Glen Falls, N. Y., was cancelled and 6th class rates applied, according to a docket at the New England Freight association.

At Boston, the carriers agreed upon the application of a 60c per ton wharfage charge on import freight including wood pulp at railroad as well as privately owned piers, except where line haul tariffs provide for absorption of the charge.

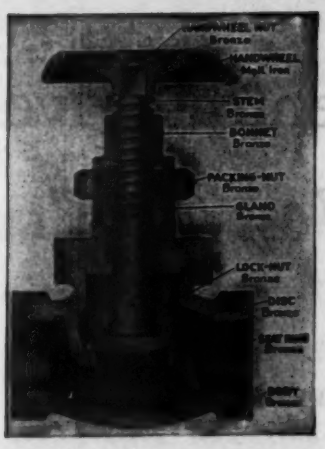
The Brown Co.'s Three Krafts

Perhaps the most important development of the month was the quoting of prices by the Brown Co., of Portland and Berlin, N. H., on three grades of kraft paper where hitherto they have confined their advertising and sales to the famous Nibroc. By offering these three grades viz: Nibroc at 5.50c, Anon at 5c and Romal at 4c to the New England merchant trade, the Brown Co. places itself quite actively in the competitive field for kraft business, for its lowest price of the three is a fine sheet of wrapping and there is every prospect according to merchants here that the Berlin manufacturer intends to go after the New England jobbing business in which outside manufacturers have gained such a big foothold.

Another New England manufacturer is offering its kraft at 3.62½c delivered Boston basis, while a middle western kraft made from spruce is quoting 3.50c delivered.

Incidentally, the Brown Co. is in the market with a low priced sulphite bond called Romal offered at a figure which will be fully competitive.

Worthy Paper Co., has introduced what is undoubtedly one of its supreme achievements in the field of distinguished papers. It is an all rag book paper, made of specially selected stock to insure permanence for books, brochures and leaflets. The watermark appears twice in each sheet and both sizes 16 by 21 and 19 by 25 have deckle edges on four sides. The stock is of great beauty and naturally sells at a price in



You can regrind the seating surface of these GLOBE VALVES without removing them.

THE Eastwood "Perfection" Globe and Angle Valves in acid bronze or stainless steel are practically indestructible. This is because you can remove the seating surface, when it shows signs of wear and regrind. The valve itself stays in the line. All parts are renewable, including the disc and seat ring. Maintenance costs are very low.

This valve is of the outside screw type. Can be repacked under pressure with valve wide open. Threads are easily oiled.

All straight lines in the body are eliminated. Long curves give the least possible resistance to the flow. No matter how the valve is placed in the line, it is impossible for sediment to settle on stem threads and cause abrasion.

53 years experience with the special operating conditions in pulp and paper mills enables us to say with confidence that Eastwood "Perfection" Valves will give you years of faithful service.

EASTWOOD WIRE CORPORATION
(Established 1877)
Belleville, N. J.
"American Paper Made On American Wires"

EASTWOOD
"Perfection" WIRES
"Perfection" VALVES

"Central, give me West 2301"

A FEW seconds later you have your party. You enjoy the give and take of actually talking with a person miles away without the necessity of leaving your business office. Distance is no barrier. You talk to London as easily as to the man across the street.

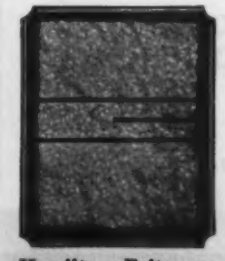
But think back, back to the time when practically every business transaction had to be written out in long hand.

The contrast between the "now" and the "then" in communication is no greater than that between Hamilton Felts of today and the paper making felt you used 70 years ago.

In every Hamilton Felt is the experience of the 72 years that have passed since Asa Shuler and J. W. Benninghofen started in business in 1858.

This experience which dictates the choice of the wools and the proper method of mixing them, the methods of carding and spinning, of weaving and fulling assures felts with all the qualities you want — long life, economical cost, enormous water removing qualities, and large production of good paper.

One Hamilton Felt is enough to convince you that there are Felts and there are Hamilton Felts. Check sheets tell no lies.



Hamilton Felts are marked by two blue lines full width of the felt and by one shorter blue line midway between them.

SHULER & BENNINGHOFEN, Hamilton, O.

The Miami Woolen Mills

Established 1858

Hamilton Felts

keeping with its quality. It is made in two shades white and toned and two surfaces "cold pressed" and "smooth." There are envelopes made for the two sizes and the two shades. Regular Worthy agents throughout the country will sell the paper.

Veteran Papermaker Celebrates Golden Wedding

On July 16, Mr. and Mrs. James Tolland very widely known among the older generation of papermakers, celebrated their fiftieth wedding anniversary at Mattapan, Mass.

Mr. Tolland, who is descended from Scotch ancestors who were papermakers on both sides for many generations, was born in Glasgow, Scotland, in 1852. Six sons and two sons-in-law are employed by the Tileston & Hollingsworth Co., where Mr. Tolland was night superintendent for many years. He takes it a bit easy now, but is still regarded as one of the most valuable men about the mill and his advice is frequently sought. One of his sons, Andrew F. Tolland, is assistant superintendent of the mill. Mr. Tolland has held positions of responsibility at Holyoke, Appleton, Wis., and at the Oxford Paper Co., at Rumford, Me., but has been at the Boston Mill since 1904. Twenty-five grandchildren were present on the anniversary.

The event was proudly reported by the Tileston & Hollingsworth Co., who consider it symbolic of the loyalty and reliability which characterizes their men.

Another New England company that takes pride in the service of its old time employees, S. D. Warren & Co., at Cumberland Mills, Me., states that Charles M. Cloudman completed 50 years of service last month. He has served under three superintendents.

Frederick Cunningham Atkins, 81 years of age, a former president of the Taylor Atkins Paper Co., of Burnside, Conn., recently passed away at his home in Middletown, Conn. He was born in Conway, Mass., in 1849. Upon the death of Mr. Taylor, he took over the interests of his partner in the company which they had jointly formed in 1897.

New financing of the Crane Co., in the form of bonds will result in sufficient funds for the construction and expansion which the company has contemplated at Dalton.

Simonds Saw & Steel Co., Fitchburg, Mass., manufacturer of cutting tools and knives widely used in the paper industry, contemplates the removal of its plant from Fitchburg where it has been one of the leading industries for many years. The city is making every effort to retain the business and has offered the company a large tract of land adjacent to the no longer used car shops of the Boston & Maine R. R. which the Simonds company has long anticipated purchasing for expansion.

Zeloid Products Co., has awarded its $10,000,000 financing contract to Austen P. Fox & Co. Zeloid has a plant at Holyoke for making a very high grade transparent paper for special wrapping purposes. Newly invented machinery plus the viscose process used in rayon manufacture will be utilized, it is understood, with wood pulp as the base. Dr. Charles Hetzel is the inventor of the basic patents. The company has a most ambitious program for the future.

The Marvellum Co., of Holyoke, is placing on the market a new paper known as Mural cover. It is in seven distinctive colors, is waterproof, durable, and has good printing qualities. An embossed surface of great beauty has been built into the stock by the converters. The paper is just on the market and shipments are being made to distributors.

Thomas C. Bowen, Great Barrington, Mass., has been engaged as a superintendent of several mills, according to the American Writing Paper Co. report. Mr. Bowen was with

Jones

A name that has won a world-wide reputation through 75 years devoted to paper-making progress

"Beaters-By-Jones"

a good investment any day—

After all you buy:- PERFORMANCE

» » all our experience and resources are applied to give you "performance" on the job. « «

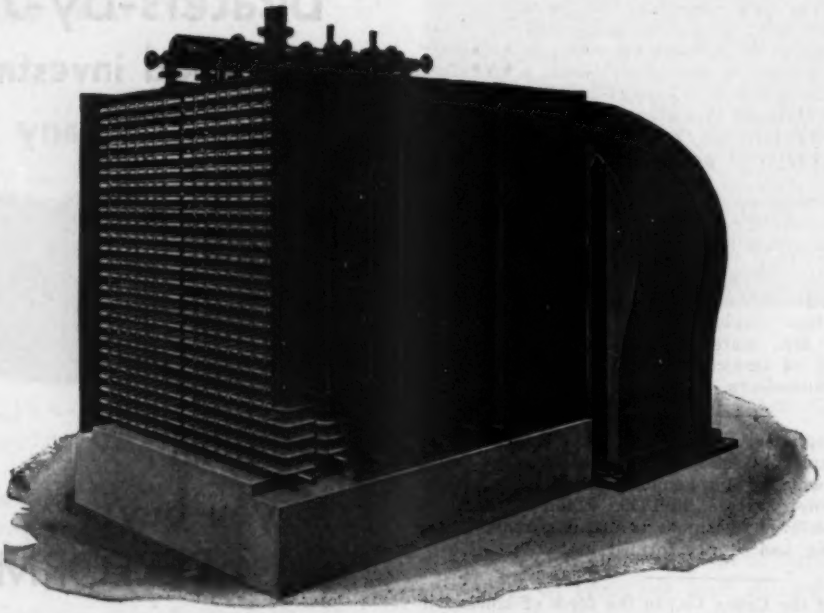
Scientific in design, sturdy in construction, low in operating and maintenance cost. See one operate.

PAPER-MAKING MACHINERY ESTABLISHED 1826 PITTSFIELD, MASS.

E. D. JONES & SONS COMPANY
PITTSFIELD . . . . MASSACHUSETTS

BUILDERS OF HIGH-GRADE MACHINERY FOR PAPER MILLS

Stickle Blast Coil Heater or Economizer Will Dry Your Felts With Hot Air



STICKLE air cooled condenser maintains a vacuum of 10 to 15 inches on the return line of your paper machine, returns condensate to the boiler room as hot as it can be handled with a pump without the admission of cooling water. Will heat 1000 cubic feet of air per minute for every ton of paper dried per day, furnishing hot air in the pit to dry the felts and absorb the vapor under the dryers, making a direct saving of at least 15 per cent in steam consumed for drying the paper and ventilating the machine room. This can be done at a moderate cost. Are you interested? Complete plans furnished without charge.

Stickle Steam Specialties Co.
INDIANAPOLIS, IND.

AUTOMATIC STEAM CONTROLS
BLOWING THROUGH DRAINAGE SYSTEMS
COMPLETE LINE STEAM SPECIALTIES

Strathmore Paper Co., for 25 years, and for the last eighteen months a vice-president and manager of the Rising Paper Co. of Housatonic. He will be second in charge to Leon M. Yoerg, the A.W.P. Co., veteran vice-president in charge of operations. Mr. Bowen was born in New York state and worked his way to positions of trust by manifesting great ability and loyalty. He was production manager of Strathmore when he left that firm.

Visit Brown Mills

A group of 20 executives and salesmen of Carter Rice and Co., the largest merchant organization in New England, spent a week end in July at the home of Hubert L. Carter, Jefferson Highlands, and a part of the following day inspecting the Brown Co. mills at Berlin, N. H., under the guidance of Dr. Richard L. Rice, manager of sales for New England for the Brown Co.

Bird & Son, Inc., were closed at Phillipsdale, R. I., for a fortnight during July and resumed on a reduced schedule. The company has done all in its power to sustain employment by employing men from idle or curtailed departments in new construction and repairs about the various mills. In this way it has kept a large number employed at its new warehouse in Norwood.

The Machais Lumber Co., Machais, Me., has been purchased by the owners of the Maine Seaboard Paper Co., Bucksport, Me. The purchase, it is understood, includes a considerable amount of timberland.

An important new mechanical development involving the paper machine is in process of being patented by a well known New England paper mill and will be announced in the near future. It is designed to speed production without affecting or in fact improving quality.

The Hurlburt Paper Co., South Lee, Mass., recently organized plans to get into production about September 1. The mill was acquired from the American Writing Paper Co., by Frank A. Juckett and associates. Mr. Juckett was formerly president of the Old Colony Envelope Co. The mill is being completely renovated for the manufacture of rag specialty papers for printing purposes, greeting cards and papeteries. Papers for technical and mechanical purposes will also be made on special machinery installed for the purpose.

W. A. Kennedy & Co., 1100 Johnston Bldg., Charlotte, N. C., has been appointed southern sales representatives for Hungerford & Terry, Inc. and the Inversand Company, Clayton, N. J., engineers, designers and manufacturers of water purification plants, water softening zeolites and base exchange silicates.

Water Tube Boilers for Every Service

BOILERS of high quality for central stations and industrial plants of all sizes, and for utilization of waste heat from kilns and furnaces. Steel construction only. Straight tube and bent tube types. Noted for long life and economy of operation.

Engineering service available—wire or write.

EDGE MOOR IRON COMPANY Edge Moor, Delaware

EDGE MOOR Water Tube BOILERS

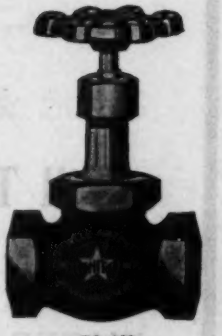
STRAIGHT AND BENT TUBE TYPES—WATER WALLS—AIR PREHEATERS

CONSTANT IMPROVEMENT IN DESIGN, WORKMANSHIP, AND MATERIALS

For the past 84 years —since the first Powell Valve was processed —there has been constant improvement in design, workmanship, and materials.

FIG. 373 "WHITE STAR" GATE VALVE

Improved designs meet the ever changing demand created through new processes, higher temperatures and pressures. Improved workmanship and materials insure safe, dependable valves under extreme working conditions.



THE WM. POWELL CO.
2521-31 Spring Grove Ave.
Cincinnati, Ohio

FIG. 102 "WHITE STAR" GLOBE VALVE

POWELL VALVES

PAPER MILLS FOR SALE

At AUSTIN, PENNA.—The Bayless Mfg. Corp.'s complete, up-to-date Paper Mill at fraction of its actual value.

At CHEBOYGAN, MICHIGAN, the Paper Mill of the Union Bag and Paper Corp., at a very low price. Exceptional water power contract offered by the Michigan Power Co.

At BUCK RUN, PENNA.—The Coatsville Paper Mills, Inc. 86" trim three cylinder machine. Good specialty mill, ready to operate.

For further particulars address

GIBBS-BROWER COMPANY, Inc.

Paper and Pulp Mill Brokers

261 Broadway, New York City

OUR MOTTO—"Service First"

POSITION WANTED—As manager, by expert paper maker willing to allow compensation to be determined by results obtained. Negotiations to be strictly confidential. Address Box 179, The Paper Industry.

WANTED—Manager with capital of fifty thousand dollars for wholesale paper house. Address Box 181, The Paper Industry.

WANTED—One, only, used Nash Hytor Vacuum Pump or Walmsley Nash type Vacuum Pump, size #4, preferably belt driven. State how long in use, and where used on machine. Address Box 182, The Paper Industry.

It Pays to Advertise Opportunities in this Opportunity Section

Bailey Meter Company

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Specializing in

Power Plant Metering Equipment

DAVIS VALVE SPECIALTIES

for Automatic Pressure and Flow Control

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FOR SALE

(In Scotch Plains, N. J., 20 Minutes to Newark)

Will Take Stock in Corporation in Lieu of Cash

FOR PARTLY EQUIPPED MILL USED TO MANUFACTURE BINDER BOARD AND PAPER SPECIALTIES. UNLIMITED WATER SUPPLY. GOOD BOILERS. 22,000 SQUARE FEET FLOOR SPACE ON TWO FLOORS. SPRINKLERED. CHEAP. CAN BE USED TO MANUFACTURE CHEMICALS, ETC.

GROSS PAPER CO., Inc.

20 CLINTON ST.,

NEWARK, N. J.

Telephone: Mitchell 3870

Edmund N. Huyck

Edmund Niles Huyck, president of F. C. Huyck & Sons, Kenwood Mills, Albany, N. Y., and Kenwood Mills, Ltd., Arnprior, Ontario, Canada, internationally known manufacturers of papermakers' felts and blankets, died at his summer home in Rensselaerville, N. Y., on Tuesday, July 16, at the age of sixty-four.

Mr. Huyck, who had been in ill health for nearly a year, was born at Rensselaerville, May 17, 1866. He was graduated from Albany Academy in 1884 and from Williams College in 1888. On his graduation from college, Mr. Huyck entered his father's business, the firm name being changed to F. C. Huyck & Sons in 1894 when Frank C. Huyck also entered the firm. This firm, originally established at Rensselaerville was moved to Kenwood and later to Rensselaer. Under Mr. Huyck's management the business was greatly expanded and it is now recognized as one of the leading felt plants in North America.

Mr. Huyck had been identified with public movements in Albany, N. Y., for many years, his interest including not only banking and manufacturing, but philanthropic work. He was a keen student of industrial problems and was considered one of the most progressive of manufacturers, having developed a system of employment and working conditions in the Kenwood mills which became a model for other factories throughout the country.

Mr. Huyck took a personal interest in professional writers and was himself the author of several works, including "Establishment Funds and Universal Health Insurance", "Industrial Medicine and Health Insurance" and "Elimination of Preventable Sickness".

Effective August 1, 1930, the Reynolite Division of the Reynolds Spring Co., Jackson, Michigan, became the wholly owned subsidiary of Cutler-Hammer, Inc., Milwaukee. This transaction brought into the constantly growing Cutler-Hammer line, the well-known and widely sold Reynolite products; bakelite flush plates, plural plugs, etc.

"EASILY THE BEST IN THE OUTFIT"

In the Champion Mill of St. Regis Paper Co., at Carthage, N. Y., there are four Dayton High Speed Beaters like the one shown here. One of the **several ways they are saving money** is by running with more than 20% less power than other makes of beaters beating kraft stock in the same mill. The statement above comes from the mill superintendent, who knows what beaters ought to do. **What Dayton claims—Dayton proves! Let's see what we can claim for you.**

The Dayton Beater & Hoist Co., Dayton, O.

Eastern Rep. Mansfield, Bolton & Kent 501 Fifth Ave., New York

Western Rep. F. H. Godfrey 415 Lenora St., Seattle, Wash.

DAYTON
High Speed Beaters

RHOADS TANNATE
WATERSHED
LEATHER
BELTING

MINIMUM STRETCH IS IMPORTANT
You Get This With Tannate

THE above Tannate belt has been on six months with no take-ups, though driving seven beaters, a Jordan, an agitator and three pumps.

Another Tannate in this mill driving a super-stack has been running twenty-two months with but one take-up. Such service is common experience with Rhoads Tannate Watershed Belts.

The difference in processes and the thorough stretch that Tannate Belts get in the making save you trouble and expense in service. Their unusual grip and longer life increase output, which in this day of severe competition is of great importance.

Tannate Belting is sold under the Rhoads Service Guarantee that leaves you to be the judge of whether your purchase is profitable.

A quick demonstration of what Tannate can do may be had on a particularly hard drive.

J. E. RHOADS & SONS

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CHICAGO.....34 N. Clinton St.
ATLANTA.....80 Forsyth St., S. W.
CLEVELAND.....1234 W. Ninth St.
Factory and Tannery, Wilmington, Del.

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April 1919
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December 1926

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Apply Box 180, The Paper Industry.

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Crystal Tissue to Build

Confidence in the upward turn of business has been declared by the Crystal Tissue Company, Middletown, Ohio. This progressive company believes this to be a propitious time to expand, looking to a bigger market for its products. Plans have been drawn and ground broken for a new administration building to be erected at North Excello, and when completed, all of the executive and business operations of the company will be transferred to the new quarters.

In announcing the new office building, Z. W. Ranck, president and general manager, stated that a feeling of regret in leaving the present office—known to be one of the old landmarks of North Excello—occupies the entire organization. The old office building was formerly one of the palatial residences of the village and holds a sentiment and attachment for all of the company's employees.

The old building will co-ordinate all departments of production and sales, increasing the efficiency of the organization and facilitating routine work. The company is well-known for its civic spirit, and following this policy has awarded the contract to Caldwell & Eseminger Company, local contractors, and declares that local workmen will be employed in the construction of the building. It is estimated that the building will be completed by January 1, 1931.

It will be a two-story structure, built of variegated cream-colored brick and trimmed in Bedford limestone. It will be erected at the entrance to the Crystal athletic field.

A simple dignity will mark the building, which will follow the most modern type of construction. The new Breaker system of electrical wiring will eliminate the use of fuses. The office window frames will be of the projected type, the windows themselves to tilt inward or outward, providing fresh air without direct drafts.

As visitors enter the building, they will be received in a large ornamental reception room by the office secretary. Next to the reception room will be the display room of Crystal products. In a few moments visitors can see the complete range of the many items which the company is selling throughout the United States and many foreign countries.

On the ground floor will be the offices of the superintendent, chemical engineer, research and plant laboratory, employment and development engineering. The sample department and the file room also will be on this floor.

On the second floor will be the president's office, directors' room, treasurer's office, secretary, assistant secretary, sales offices, auditor, purchasing, cost accounting, and a general conference room.

Contracts have also been awarded the Caldwell and Iseminger company for a new building housing three tissue machines and the finishing room of the old Crystal mill. This work has already started. The building will be a strictly modern factory of concrete, brick and steel construction, two stories high, 88 feet by 166 feet. It is being built over the present machine room and finishing room without interfering with manufacturing operations. When the new building is completed, the old construction will be torn out without stopping any of the regular production. This part of the construction will be started by October 1.

In addition to this construction program, the company's paper machines are being modernized thoroughly.

The cost of the improvements will total $250,000.00, officials of the company estimate.

The Cheney Pulp and Paper Company, Franklin, Ohio, has recently made a number of improvements in its plant. High speed beaters have been installed, as well as Bird centrifiners and texrope drives, at an expenditure approximating $35,000. The company is also planning to erect a new warehouse to be used for the storage of raw stock as well as finished material, the building to cost $50,000.

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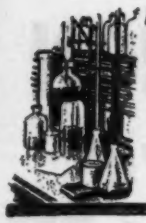
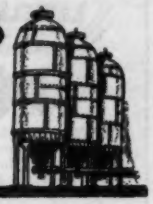


Technical Developments in the Paper Industry



Domestic and Foreign

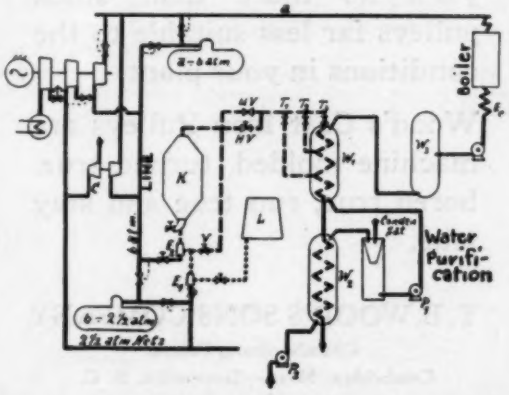
The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Pulp from Tobacco Waste

THE process of making pulp from tobacco waste materials consists in first extracting the nicotine in some suitable manner, and then also removing from the waste material all other constituents which are readily soluble in water. Then the extracted tobacco plant material is mechanically reduced to a mass of matted strips. The matted mass is dried and then beaten in water together with other materials to produce a pulp. R. B. Arnold, Richmond, Va., and R. M. Hixon, Ames, Iowa, assignors, Tobacco By-Products & Chemical Corpn., Louisville, Ky. United States Patent No. 1,756,722, filed Nov. 12, 1927.

Waste Heat from Digesters and Its Possible Utilization

THE general thermal conditions surrounding the pulp digestion process are reviewed. A heat balance is struck for the operation as follows: heat consumed per kilogram of pulp 1840 calories; heat recovered from the waste heat, heat in liquor driven over and waste gases 465 calories, heat in



waste liquor 250 calories and heat loss saved 100 calories, making a total of 815 calories. A method of saving heat is outlined and the manner of its working is illustrated in the accompanying figure.

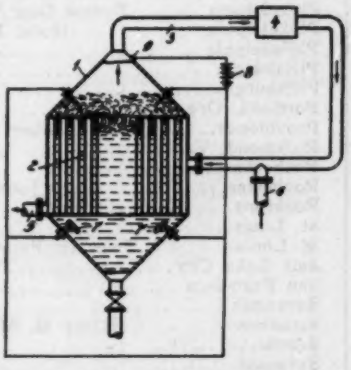
The digester (K) is filled and steamed. Then it is brought up to a pressure of 4.5 atmospheres by steam from the six atmosphere line fed by means of the injector (E_2). Then the steam inlet to the injector (E_1), which is on the 2.5 atmosphere line, is opened simultaneously with the flow of liquor from (L) to (E_1). The fresh liquor is heated in (E_3) to a temperature of 105 deg. C. by means of the six atmosphere steam, after it has first been heated up to 80 deg. C. in the injector (E_4). Then the liquor is fed into the digester. As soon as the digester is filled with liquor, the flow of liquor to (E_4) is shut off. The steam flow is also stopped. Thus the valve (V_1) is opened, so that the liquor flowing from (K) is again introduced into (E_3). A temperature regulator controls the flow of steam to (E_3) in such a manner that only sufficient steam is added to bring the liquor up to the desired temperature.

At the moment that the liquor flowing through (V_1) attains the maximum digestion temperature, a second relay closes the flow of steam to (E_3). The feed water heaters (W_1) and (W_2) are heated by the heat in the steam, vapors and the liquor that are driven out of the digester during the control of the pressure within the same. The waste gases from the digester are also caused to flow through heating coils in the feed water heater (W_1) so that as complete recovery of heat as possible is attained. W. Schmid, Der Papier-Fabrikant, 1930, pages 138 to 141.

Concentrating and Evaporating Sulphite Waste Liquors

THE object of the new type of waste liquor evaporator, which is shown in the accompanying illustration, is to improve the economy of the concentrating process from the thermal standpoint. The vapors that are formed during the evaporating process are brought up to a higher pressure in known manner and used for heating the evaporator. Furthermore, the liquor which is being evaporated is subjected to the action of an electric current.

The illustration shows diagrammatically an arrangement for carrying out this process. The evaporator (1) is constructed cylindrically in its lower part and is pierced with numerous tubes in this part. These tubes are shown at (2). Both the top and the bottom of the evaporator are formed conically. The liquor which is being evaporated fills the lower conical portion and the tubes. The vapors that are formed during the evaporation of the liquor are sucked up through a tube (3), compressed in a compressor (4) and then



again introduced into the evaporator at an increased temperature. In the meantime, the steam circulates around the heating pipes (2) and raises the temperature of the liquor up to the boiling point. The condensate that is obtained in this heating process is removed through the outlet (5). The pipe used to introduce steam into the evaporator is shown at (6), this steam being used in case the vapors are not sufficient for the evaporation. Moreover, anodes dips into the liquor, these anodes being shown at (7). They are in an electric circuit with a source of current (8) and the negative pole connection (9) on the wall of the evaporator.

When the liquor is subjected to the action of an electric current, the deposition of materials on the pipes is largely prevented, and these materials collect in the lower portion of the evaporator and are removed from time to time. This results in the product, that is finally obtained, being quite free from impurities. It also results in so favorable a transmission of heat from the steam condensed from the vapors that the process is carried out at high economy. Siemens-Schuckertwerke A.G. German Patent No. 486,460.

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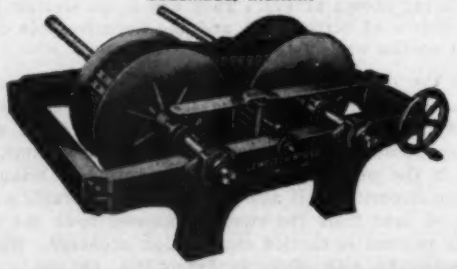

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Bleaching Pulp

ACCORDING to the new process unbleached pulp is fed to a thickener of some suitable sort in which the density of the stock is brought to a high point, such as approximately twenty-four to forty per cent dry content. In this state the mixture of the pulp and the bleach liquor still has a high density, which amounts to approximately ten to forty per cent which is very much higher than the usual density of the stock in the beater, namely, approximately six to eight per cent. The mixing with the bleach liquor or with this and water, in certain cases with the addition of heat, takes place in a mixing apparatus of the ordinary type. The thoroughly mixed stock and bleach solution leaves the mixing apparatus after a few seconds and enters the bleaching apparatus itself with a stock density of ten to thirty per cent. The stock is in the form of a crumbly mass under these conditions.

The bleaching apparatus is built in the form of a drum. At the moment that the stock leaves the drum, it is diluted with water to one to two per cent, then it is washed with the aid of the ordinary type of washer and introduced into the dehydrating apparatus, which it leaves in the form of bleach stock in boards.

It is advisable to carry out this process in two or more stages and to wash the stock between each stage. Washing has for its purpose the removal of the products of the bleaching reaction. This is important for if these products are allowed to remain in the stock, they will consume quantities of bleach in the bleaching operation proper, and thus increase the consumption of bleach unnecessarily. C. B. Thorne. German Patent No. 488,773, filed Oct. 28, 1925.

Chemistry and Technology of Bleaching Pulp

THE literature on the subject is briefly reviewed. The processes are discussed not only from the technical standpoint but also from that of the consumption of materials. The accompanying illustration shows the arrangement of apparatus in pre-bleaching process in which chlorine water is used as the bleaching agent.

The various parts of the apparatus are designated as follows: The dehydrating apparatus is shown at (1) in which the stock is dehydrated until a stock density of eight to twenty per cent is attained. The stock then flows through the mixer (2) and from there into the reaction vessel (3) which is provided with a stirring apparatus. It takes the stock approximately twenty minutes to pass through this reaction vessel. The back-water outlet from the dehydrating apparatus is shown at (A). Alkali is added through (B) into the mixer (2) and fresh water enters the reaction vessel at the bottom through (C) carrying the stock into the vat (4) where the stock is allowed to attain an equilibrium of reaction. This vat is provided with a propeller and overflow. The stock is removed from the vat (4) by means of the stock pump (5) and eventually reaches the vacuum filter (7). A regulating device (6) is provided on the vat (4) for the purpose of controlling the concentration of the stock.

The waste water from the vacuum filter flows through the outlet (E). The vacuum filter effects a concentration of twenty per cent. The stock is removed from the filter and is raised by means of the elevator (8) to a point high enough to obtain gravity flow. The stock then flows into a screw conveyor (9) and thence into a mixer to which chlorine water is added. The mixer is shown at (10) and the chlorine water enters at (F). The stock mixed with the chlorine water then flows by gravity into the chlorinating vessel (11) which is provided with an agitating device. The time that the stock remains in this apparatus is approximately sixty minutes. Fresh water enters this apparatus through the inlet (C') and this water is used to remove the stock from the chlorinating vessel (11) and deliver it into a washing apparatus, where a concentration of eight to twenty per cent is attained. Alkali is added through (B') to the stock before it enters the mixer (13), whence the stock falls into the reaction vessel (14) which is also provided with a stirring device. The stock takes approximately twenty minutes to pass through this vessel. Fresh water is added to the reaction vessel (14) through the inlet (C'') and this water carries the stock to the vacuum filter (15). The waste water from the latter apparatus passed through the outlet (E'') and then the stock passes into the after-bleaching apparatus.

It is pointed out that the most important conditions in the preliminary bleaching operation are regular distribution of the stock and of the chlorine in the chlorination and thorough washing. Vacuum filters have been found to be best suited for this purpose. Various advantages of the process are outlined. Dr. L. Rys, Zellstoff und Papier, 1930, pages 163 to 166.

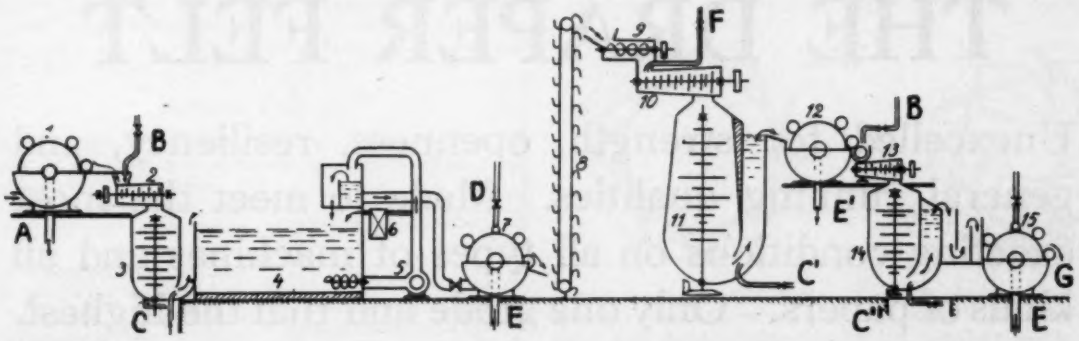
New Problems in Sizing Stock

ALL possible sizing results can be grouped into two classes, sizing in alkaline beater, and sizing in acid beater. In the first case the beater does not contain any ingredients before the addition of the size, which ingredients change the state of dispersion of the size. The author has been concerned with making extensive use of the alkaline beater particularly for his wax sizing process, which is more sensitive to conditions than the rosin sizing process. Numerous tests have shown that the consumption of size does not vary more than ten per cent. Alkaline sizing is unfortunately limited in applicability.

Acid sizing is defined to be a condition in the beater before and after the addition of the size indicating an acid reaction equivalent to pH less than 7. Free rosin is important in acid sizing. The author describes a process, called the "Bewoid Process" for preparing the size. He claims that the size of particles obtained thereby vary from half to one mu, and that the dispersions obtained represent a size with one hundred per cent free rosin and also that the free rosin content can be controlled at will between zero and one hundred per cent.

The author also concerns himself with a discussion of the behavior of the dispersoid state of the rosin in the mechanically obtained suspensions in respect to the rosin in soap-containing free rosin sizes. Experiments are being carried out and are not yet completed. The author discusses in detail the properties and characteristics of the Bewoid dispersions.

There is no principal difference between alkaline and acid sizing. No phenomenon in the sizing process has been ob-



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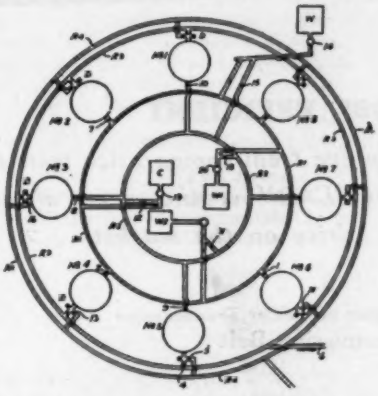
served which contradicts the hypothesis of optimum particle size of the rosin gel. The limits of optimum particle size remain to be determined. There is no question about the upper limit, which lies in the neighborhood of one mu. The lower limit has not yet been established, but the author believes it to be 0.1 mu. Dr. B. Wieger, Der Papier-Fabrikant, 1930, pages 113-116.

Making Paper Pulp

THE illustration shows an apparatus for the manufacture of cellulose pulp from fiber yielding vegetable materials. A number of digesters are used for this purpose, eight in all, as may be seen from the illustration. The digesters are



arranged in a circle. Circular piping systems connect the digesters and afford means whereby the liquor in any one digester may be removed and fed into another. The piping system also allows the feeding of any digester with liquor, wash water and the like, and also the discharge of the spent liquor. Means are provided for the introduction of steam.

The process is of the cascade type. The materials are treated in the digesters under pressure and in stages. The pressure is progressively increased as well as the active liquor concentration at each stage until the digestion is nearly complete. Then the active liquor concentration is varied in the final stage sufficiently to prevent hydrolysis of the cellulose fibers. E. Spencer, Calcutta, India. United States Patents Nos. 1,761,543-4, filed Feb. 10, 1928.

Bamboo Pulp

BAMBOO stems are disintegrated in an apparatus of the type shown in the accompanying illustration. The stems are passed between pairs of rollers which are grooved circumferentially to split them along their length, and pairs grooved longitudinally to bend them at right angles. The rollers are graded in depth and pitch to increase the severity of the action. Each roller comprises a core (1), with a reduced journal portion (2) at each end, a divided two-part cover or sleeve (3) and end flanges (4). The sleeves are either grooved circumferentially to form the knife edges (7), or longitudinally to form ridges (10). The upper and lower rollers of each pair are arranged so that the knife edges or ridges interengage but do not touch. Tables are arranged between the pairs of rollers to convey the material, and these tables may be perforated to allow the dust to fall through them and be drawn away by a fan. J. L. Jardine. The World's Paper Trade Review.

FIG.1.

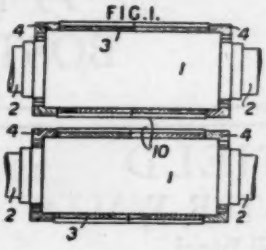
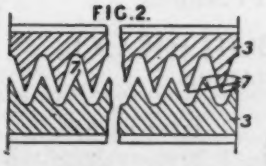
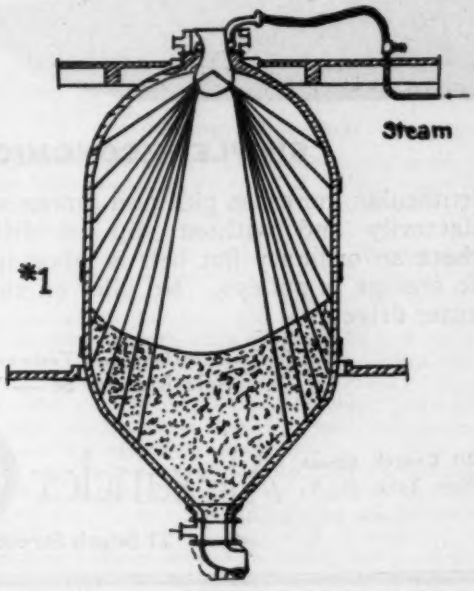


FIG.2.



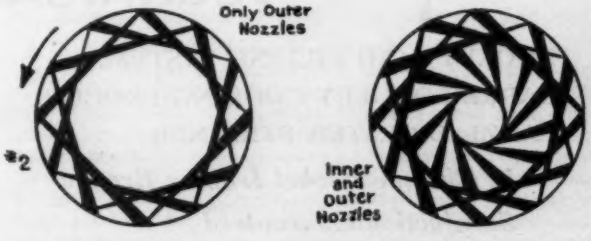
Device for Filling Digesters with Steam

THE device which is used for steaming the digester is shown in the accompanying illustration. It consists essentially of a special form of steam nozzle. This nozzle is able to convert the pressure of the steam almost entirely into speed, and is claimed to have the maximum thermo-dynamic efficiency. The speeds which are attained are as high as 1,000 meters per second. A disadvantage of the nozzle is that a slight wear in it is sufficient to influence the effectiveness of the device. The nozzles are accordingly made so that they



are exchangeable. They may also be made of material that resists wear. This is important.

The circular sketches show the necessity of using both inner and outer nozzles. It is seen from the sketch marked "only outer nozzles" that a portion of the chips in the digester will



not be sprayed by the steam. The difference is shown in the sketch marked "inner and outer nozzles." The use of the inner and outer nozzles ensures the complete filling of the space within the digester with wood. Various tests are described showing the results obtained with this method of filling the digester. Dr. Scholz, Der Papier-Fabrikant, 1930, pages 223-225.

Determination of the Absorbing Powers of Blotting Paper

THE height to which liquor is absorbed by blotting paper is not a sufficient indication of the practical usefulness of the paper. This factor is intimately connected with the internal porosity of the paper. It has not been clearly demonstrated whether or not this is connected with surface properties. The suction height determined after ten minutes is almost proportional to the volume of the pores in the paper and is dependent on the properties of the absorbed liquor, its viscosity and surface tension. The absorbent powers of the paper surface were determined by the Dalen

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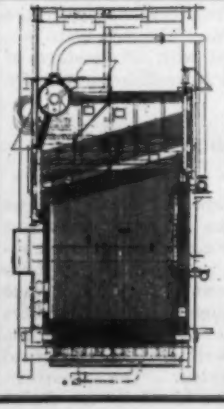

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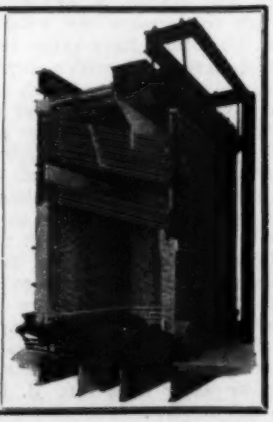

process. While the principle of the method is correct, the author finds that the manner in which it is carried out is not, for drops rolled out on a smooth paper leave long narrow streaks, while on a rough surfaced paper the streaks are short and wide.

The author has developed a blotting paper tester which works on principles that correspond to practice. A wavy motion is given to the sample of blotting paper under constant load and with constant speed. The test indicated that there is a direct relation between the surface area of the rolled out ink drop and the quantity of ink used as well as an increase in the surface area with increasing testing speed. The author has deducted some interesting conclusions from the results, taking into consideration the speed of absorption in the surface. An absorbing capacity for a good grade of blotting paper, rolling out coefficient of a drop containing 9 cm. equal to 9.3 square mm. of surface area, is 27 per cent for the surface in contradistinction to that in the interior. W. Holwech, Papir Journale, volume 17, pages 273ff.

Measuring Moisture in Paper and Pulp Webs

THE new device that has been devised for this purpose is based on the fact that a paper web of constant thickness shows different plasticity according to the moisture content varying between the press rollers and the dry end of the machine. The resistance of the paper web towards bending, folding and the like also varies with the moisture. The paper web is accordingly passed between fixed and movable bending organs, which act on both sides of the web, as may be seen from the accompanying Fig. 1. The bending device is provided with rollers which are formed and arranged in the manner indicated in the figure. They accordingly bend the paper web in waves. The depth of these waves is dependent upon the bending property or elasticity of the paper web. The movable part of the machine records the bending in terms of moisture in the paper web. This is read off a scale as shown.

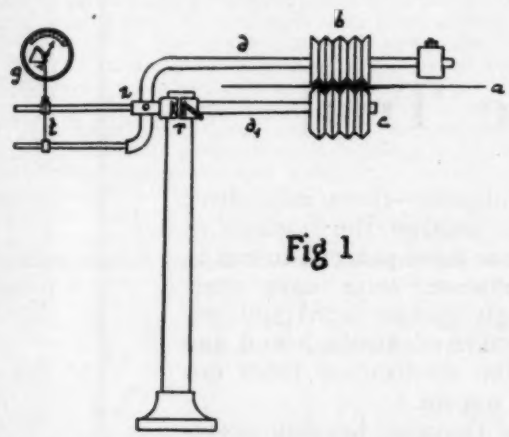

Fig 1

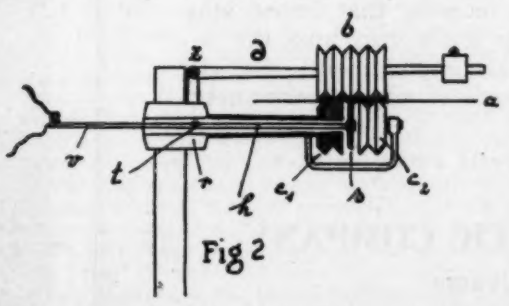

Fig 2

In Fig. 1, (a) represents the paper web and the two rollers are seen at (b) and (c), of which the lower roller (c) can be rotated while the upper roller (b) is stationary. The arm on which the latter is fixed can be moved about the pivot (z). The arm (d) is also provided with a weight.

A second method of measuring the moisture content of the paper web is shown in Fig. 2. This is analagous with the method shown in Fig. 1 but with this difference that the more or less great bending of the paper web and the position of the roller (b) corresponding thereto results in the reversal of the disc (s) which undergoes displacement due to the action of the paper web. The contact may be caused to actuate a signalling device, which announces the overstepping of the normal moisture content in the paper web.

The invention may be modified in various ways. For example, the roller (c) may be displaced by indentations in the surface of a drying cylinder or of a guide roller, over which the paper web passes. W. Schmid. Der Papier-Fabrikant, 1930, pages 257 to 259.

Beating Paper Pulp

THIS particular series of investigations was concerned with the determination of the effect of various reagents on the stuff in beating, and of the effect of beating on the viscosity of the stock.

The stock was beaten in ball mills. Pretreatment with dilute solutions of strong acids causes wet beating to be attained rapidly, owing to the reduction in the degree of aggregation of the cellulose, but increasing loss of minute fibers or slime from the wire cloth results and the strength of the paper sheets is greatly diminished. When such dilute solutions are used as beating media, the effect is the same as when water alone is used. Weakly xanthated pulps give very wet pulps which become very free when decomposed with acid. Addition of alcohol or glycerin to the water retards beating. Pulps treated with concentrated zinc chloride solutions before beating give very free stuffs and very absorbent paper sheets. Those beaten in alkaline solutions also give free stuffs, but pulps pretreated with concentrated alkaline solutions can only be wet-beaten with difficulty. Kraft pulps become soft on bleaching, and are easily wet-beaten, but the effects of bleaching sulphite pulps depend on the degree of bleaching.

The tests on the effect of beating on the viscosity of the solution are carried out on surgical cotton which was then dissolved in cuprammonium solution. N. Nakano, Journal of the Cellulose Institute, Tokyo, 1930, volume 6, 89-99, 106-7.

Digesting Cornstalks with Monosulphite Liquors

A NUMBER of experiments on the digestion of cornstalks with the aid of monosulphite liquor. The results are tabulated and the following interesting conclusions were obtained from them. The product that is obtained from cornstalks by digestion under pressure with twenty per cent sodium bisulphite liquor is brown and differs very little from that obtained by digestion under pressure with water alone. By increasing the concentration of the liquor to thirty to forty per cent, the product obtained is no longer brown and the disintegration is more uniform. The addition of small amounts of sodium hydroxide to the digestion liquor has been found to be highly advantageous. The content of ash and silica in the product is high and quite constant. The pentosan content of the product is affected only in very slight degree by change in experimental conditions. E. Horvath, Der Papier Fabrikant, 1930, pages 239 to 241.

Working Up Waste Digestion Liquors

THIS process is concerned with working up the waste digestion liquors obtained from the digestion of pulp with sodium sulphite. The liquors are treated with alkaline earth basis, for example milk of lime. The liquor is then separated from the precipitated calcium sulphite and this is then mixed with bisulphites particularly a calcium bisulphite which is recovered from the precipitated calcium sulphite. The remaining solution is then separated from the residues which contain the organic substances. The residues are worked up in the usual manner in certain instances being subjected to dry distillation. Societe Barbou & Cie., Paris, France. German Patent No. 490,053, filed March 29, 1927.

Blazing the Trail

EVERY age has its trail blazers—those inquisitive beings with an urge to enlarge the horizon of human knowledge. Some have put out to sea in frail shells of boats, powered with oars, their course recorded for others through spoken word and uncertain memory. Some have shouldered flintlock and axe to wrest new breathing space for civilization from unfriendly aborigines and unwilling nature.

And some explore new fields of thought, braving prejudice and tradition, fighting their ways through ignorance and fear of change. For mankind's desire is to go ever forward into the unknown—toward the eventual unknowable.

The broken twig, the slash in the tree, the cairn of stones—all have served to mark the advancing step of man's progress. But they are records that must stay where they are put, while today trails run into the intangible things of the mind's accomplishment. So the newer trails are blazed with records of paper, permanent, portable, and adaptable.

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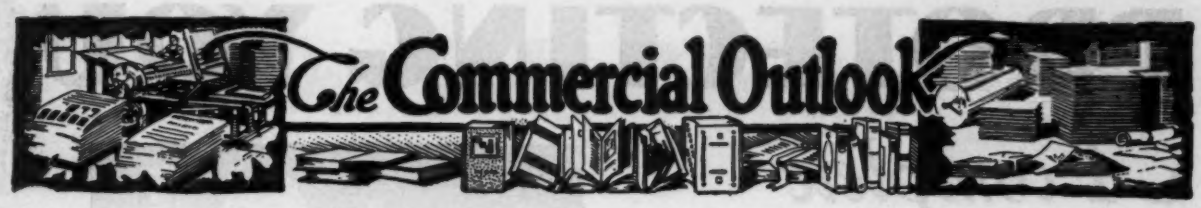

New York, August 1, 1930.

MIDSUMMER quietness is the main characteristic of the paper market at present, and there is little development of trade activity excepting along routine lines and of limited scope. Yet, there are signs that business in the commodity is on the verge of expansion, and there are accumulating indications that the industry as a whole is destined to experience much more favorable marketing conditions during the remainder of the year than has been the case in the last few months.

Buyers, and this includes consumers, converters and distributors, are proceeding rather cautiously in their absorption of supplies of paper. This policy on their part is not due to any situation within the paper industry specifically but can be attributed to the general business conditions obtaining. There is a pronounced disposition on the part of business concerns to keep their capital as liquid as possible under prevailing circumstances, and purchasing of all materials is being confined to bare necessities. Obviously, the paper market is affected by this attitude of buyers along with all other commodity markets. Still, it is plainly evident that a change is coming over the business sentiment of the country; that manufacturers and merchants are expecting a broader movement of merchandise, an improved buying spirit among the general public, and a return to nearer normal business conditions. Once sentiment is swayed in the right direction and leads to a regaining of confidence in the commercial structure of the nation and in the outlook for business, there appears scant doubt that trade activity will revive with a rush. Just when this will occur is anybody's guess, but opinion in well-informed circles is increasing that the general situation will be righted to at least an appreciable degree during the coming fall and early winter, and that, if so, substantial improvement will be witnessed in business before the year peters out.

The paper industry is not in so poor a position, according to most reports from manufacturers and dealers, and when all of the circumstances are considered. There is, from an aggregate standpoint, a fair volume of business transpiring in the various classes of paper and board. True enough, buyers are mostly operating in small amounts, which is to say that the orders being placed are chiefly for small lots of paper, yet a majority of paper and board mills are operating on a fair scale for this period of the year, and it is a fact that market activity has broadened recently to an extent necessitating manufacturers increasing their production.

Prices of paper are exhibiting more stability than has been seen in some while. The sharp downward trend in some divisions of the market apparently has been definitely checked, and within the past few weeks advances of slight dimensions have been registered in some classes of paper. It would seem that manufacturers have arrived at the conclusion that it avails them nothing to slash prices in an effort to stimulate demand; that they can market just as much of their product by maintaining prices as they can at reduced rates. Experience is a good teacher, and it would appear as if paper producers have been taught a few valuable lessons during the depression period in recent months.

Production of paper in the United States showed a slight decrease in May as compared with the preceding month, totaling 525,829 net tons of all grades, against 532,594 tons produced in April, representing a decline of 2 per cent. The May output was 11 per cent below the production in the corresponding month last year, according to identical mill reports to the American Paper and Pulp Association. The May production of newsprint, uncoated book, paperboard, wrapping, bag, writing, tissue and building papers registered a decrease as contrasted with May, 1929, while the output of all grades of paper showed a decrease during the first five months of the current year as compared with the corresponding period a year ago. Shipments of paper from mills during May amounted to 515,650 tons, against 517,833 tons in the preceding month. Mill stocks at the end of May aggregated 291,062 tons, comparing with 279,863 tons a month previously, showing an appreciable increase. All grades, excepting bag and building papers, registered increases in inventory at the end of May as contrasted with a month before, while as compared with the end of May, 1929, all grades excepting wrapping and bag papers showed increases in stocks.

Production of newsprint in the United States in June amounted to 108,398 tons and shipments from mills were 106,883 tons, compared with 118,093 tons produced and 114,702 tons shipped in the preceding month, while production in Canada was 213,634 tons and shipments were 212,670 tons, contrasted with 237,681 tons produced and 239,034 tons shipped in May, according to the News Print Service Bureau. Thus, total production of the two countries in June was 322,032 tons and shipments 319,553 tons, compared with an output of 355,774 tons and shipments of 353,736 tons in the preceding month. During June, 23,891 tons of newsprint were made in Newfoundland and 683 tons in Mexico, so that the total North American production for the month amounted to 346,606 tons.

The Canadian mills produced 27,400 tons less of newsprint in the first six months of 1930 than in the same time last year, which was a decrease of 2 per cent. The United States output was 11,471 tons or 2 per cent less than in the first half of 1929. Production in Newfoundland was 17,224 tons or 14 per cent more in the first six months of 1930 than in 1929, and in Mexico 1,265 tons less, making a total decrease of 22,913 tons. During June the Canadian newsprint mills operated at 73 per cent of rated capacity, United States mills at 79.9 per cent and Newfoundland mills at 103.8 per cent. Stocks of newsprint at Canadian mills totaled 45,229 tons at the end of June, and at U. S. mills 29,507 tons, making a combined total of 74,736 tons, which was equivalent to 4.4 days' average production.

Paperboard production in the United States in May amounted to 241,681 tons, as contrasted with 245,167 tons produced in the preceding month, according to the monthly statistical summary compiled by the U. S. Department of Commerce. Shipments of board from mills during May aggregated 239,945 tons, against 241,458 tons in April, while stocks at mills at the end of May were 75,542 tons, compared with 72,071 tons a month earlier. Board production in the first five months of this year totaled 1,176,185 tons, against 1,277,234 tons in the corresponding period last year.

An advance of $5 per ton has been announced in prices of southern kraft paper, bringing the basis up from $70 to $75 a ton. Demand for kraft has been fair, and reports say that most mills are well fixed with orders. Fine papers display decided price firmness, and are favored with moderate demand. Small-lot orders have increased in number recently, according to representative manufacturers and merchants. Tissue is still in a quiet market position, whereas book paper is moving passably well although mainly on contracts. This is the period of the year when consumption of newsprint is at the lowest, and the market for print paper is characterized by no noticeable feature. Boxboards are maintained in price, with eastern mills quoting $35 a ton for plain chip and $37.50 for news board for delivery in New York City.

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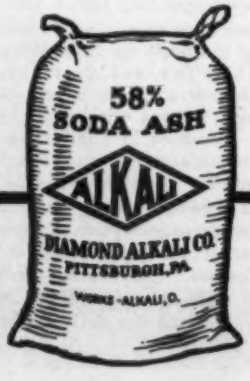

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Papermaking Rags

Although current demand for papermaking rags is quite typical of the midsummer period, with paper manufacturers in general giving limited attention to the market and absorbing only such supplies as they have actual need of, the market seems to be possessed of a fairly steady undertone and prices appear to have settled on levels which give promise of constituting the bottom of the decline which has been seen in rag values in recent months. Dealers and importers are laying considerable stress on the small amounts of rags coming into the market from supply sources and on the firmer position of prices in quarters where they buy, and it is becoming common opinion among those on the selling side of the trade that any appreciable expansion of mill demand for rags of almost any class would lead to a quick and certain rise in market rates.

As a matter of fact, there is little or no doubt that the condition of the market and the low level of prices recently have caused dealers to materially curtail collections of rags, and it is very likely that stocks in the hands of collectors and graders the country over are smaller today than normally. Also, the sinking of market values here has resulted in a falling off of importations, because dealers in the various European countries have been enabled to secure better prices in home markets than in shipping their rags to the United States. This latter situation is attested to by official U. S. Department of Commerce statistics which show that imports of papermaking rags in the month of May amounted to only 30,333,061 pounds, registering a sharp decrease as compared with 36,888,998 pounds imported in the preceding month and 43,643,859 pounds in May last year.

Owing to the comparatively small stocks, dealers are not exerting much selling pressure on the market, but are pursuing a waiting policy in the confident belief that the needs of paper mills will increase and that when this occurs, consumers will resume purchasing on a larger scale and will grant more favorable prices than now prevail. In short, it is appreciated that paper manufacturers are refraining from buying except in a small way not because of ruling costs of rags but because they are not in want of supplies, due to poor business in their own products, and that efforts to force buyers to operate would meet with little success and would only result in weakening prices. Reports tell of a fair demand for domestic roofing stock, and of a steadying of prices of such rags. Mills are directing nearly all of their buying of these rags at present to domestic material, owing to lower prices obtaining here than abroad, which is creative of a comparatively good call for domestic roofing. Prices are well stabilized on levels of about 1.20 cents per pound f.o.b. New York for cloth strippings, and 70 to 75 cents a hundred pounds on No. 2 domestic roofing stock. Foreign dark cottons are on a quotable basis of about one cent a pound ex dock New York, though mills are not eager for these rags at this price level and are mostly bidding slightly lower.

New cotton cuttings of some grades are moving moderately well at maintained prices, with light silesias reported bringing 6.75 to 7 cents a pound at dealers' shipping points, No. 1 white shirt cutting around 8.50 cents, fancy shirt cuttings 5.25, blue overall cuttings 6.75 cents, No. 1 washables 5.25 cents, and unbleached muslins 9 to 9.25 cents. Production of most cuttings is on a small scale, which helps to sustain market values as dealers are not pressed to sell.

Old No. 1 repacked whites are steady in price at around 5.75 cents per pound at shipping points, with quotations ranging half a cent per pound on either side of this figure, depending on the packing of the rags concerned, while repacked thirds and blues are quoted at around 2.50 cents a pound. Not much is doing in foreign rags of any grade, since prices ruling abroad are in nearly every instance above a parity with market values here.

Average quotations f.o.b. shipping points and ex dock New York are as follows:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	8.25– 8.75
White shirt cuttings, No. 2	6.50– 6.75
Fancy shirt cuttings	5.25– 5.50
Washables, No. 1	5.25– 5.50
Unbleached muslins	9.00– 9.25
White lawns	7.75– 8.00
Overall cuttings, blue	6.75– 7.00
Black silesias	4.50– 4.75
Canton flannels, bleached	8.50– 8.75
Canton flannels, unbleached	7.25– 7.50
Shoe cuttings, bleached	6.75– 7.00
Shoe cuttings, unbleached	6.00– 6.25
Light silesias	6.75– 7.00
O. D. khaki cuttings	5.75– 6.00
Mixed khaki cuttings	4.75– 5.00
Corduroy cuttings	3.25– 3.50
Cottonade cuttings	3.00– 3.25
Linens, No. 1 white, foreign	14.00–15.00
Light prints, foreign	4.00– 4.50
Old Stock—	
Whites, No. 1, repacked	5.25– 6.50
Whites, No. 2, repacked	2.75– 3.00
Whites, house soiled	2.00– 2.25
Whites, street soiled	1.75– 2.00
Thirds and blues, rough	1.60– 1.80
Thirds and blues, repacked	2.25– 2.50
Lace curtains	4.75– 5.00
Black stockings	4.10– 4.25
Cotton canvas, No. 1	4.25– 4.50
White cotton batting	2.00– 2.25
Roofing, No. 1 (cloth strippings)	1.15– 1.25
Roofing, No. 2	.70– .80
Linsey garments, foreign	1.15– 1.25
Dark colored cottons, foreign	1.00– 1.10
Blue linens, foreign	3.00– 3.50
Gray linens, foreign	3.00– 4.00
White linens, foreign	7.00– 7.50
Light prints, extra foreign	2.00– 2.25

Rope and Bagging

Market prices of old rope have displayed a declining trend and are now on lower levels, with demand from paper mills noticeably restricted. Signs are that most papermakers using old rope have ample supplies on hand, and sellers consequently are experiencing difficulty finding consumers who are interested in buying. Domestic No. 1 old manila rope is reported available at 3.25 cents per pound f.o.b. dealers' shipping points, and perhaps at slightly under this price, while most bids on imported old rope do not exceed 3 cents a pound ex dock New York or other American Atlantic ports. Bagging also is in less demand than it was, paper manufacturers who were fairly active buyers for a time having let down in their acquisition of supplies, and prices tend to weaken. No. 1 scrap bagging is available to mills at 1.50 cents a pound at points of shipment, gunny bagging at 1.55 cents, and roofing bagging at 60 cents per hundred pounds.

F.o.b. shipping point and ex dock New York quotations follow:

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	New York and Chicago
Gunny, No. 1 domestic	1.55– 1.60
Gunny, No. 1 foreign	1.50– 1.60
Scrap bagging, No. 1	1.50– 1.60
Roofing bagging	.60– .65
Wool tares, heavy	1.65– 1.75
Wool tares, light	1.55– 1.65
Manila rope, No. 1 foreign	3.00– 3.25
Manila rope, No. 1 domestic	3.25– 3.50
Sisal strings	1.75– 2.00
Mixed strings	.80– .90

Old Paper

After a lengthy period of acute depression and extremely low levels of value, the market for the cheaper grades of old paper is commencing to develop signs of improvement. Demand is better, particularly from box board mills, and prices have stiffened to a degree where market rates have scored a few points rise. Moreover, dealers are more cautious about accepting orders, especially when tonnage lots are involved, while apparently limiting their sales to stock immediately available for shipment, since they are not willing to tie themselves up on forward commitments, thus attesting to their belief that the market is due to record further improvement.

Prices of No. 1 mixed paper in the East are now 20 to 25 cents per hundred pounds f.o.b. New York, and of folded newspapers 35 to 40 cents a hundred. No. 1 container manilas are quoted at 30 to 35 cents a hundred, and new corrugated box cuttings at 45 to 50 cents. Higher prices than these are generally asked in the Middle West. The better grades are about standing still in price, with No. 1 hard white shavings quoted on a range of 2.50 to 3 cents a pound, according to quality of packing, and soft white shavings at 2.35 to 2.70 cents. Heavy No. 1 book stock is available to mills at $1 per hundred pounds at shipping points, and No. 1 old kraft paper at 1.35 cents.

The following are quotations named by dealers f.o.b. shipping points:

	New York and Chicago
Hard white shavings, No. 1	2.50– 3.00
Hard white shavings, No. 2	2.25– 2.50
Soft white shavings	2.35– 2.70
Colored shavings	.70– .80
Heavy book, No. 1	1.00– 1.05
Crumpled book, No. 1	.75– .80
Ledger stock	.75– 1.20
Kraft No. 1	1.30– 1.40
New kraft cuttings	1.90– 2.00
White blank news	1.70– 1.80
Manilas, No. 1	.45– .60
Manilas, container	.30– .35
Folded news	.35– .50
Sulphite mill wrappings	.50– .60
Old corrugated boxes	.35– .40
New corrugated box cuttings	.45– .50
Mixed paper, No. 1	.20– .35
Common paper	(Nominal)

Pulpwood

Other than routine business, mostly on a contract basis, little is doing in the pulpwood market, with quotations adhering to unchanged levels, according to reports. Exports of pulpwood from Canada, virtually all of which came to the United States, in the first six months of this year totaled 633,443 cords, valued at $6,166,167, showing an increase over the 612,946 cords of a value of $5,942,623 exported in the similar time last year.

Mechanical Pulp

Demand for mechanical wood pulp is along restricted lines, especially as regards the transient call for supplies. On the other hand, there is a steady movement reported against contracts and old orders, which is absorbing the bulk of the supply available and helping to sustain market rates. Prices show little change and seem marked by a fairly

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for pulp and thick stock

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Soda	up to	60 Tons
Groundwood	up to	50 Tons

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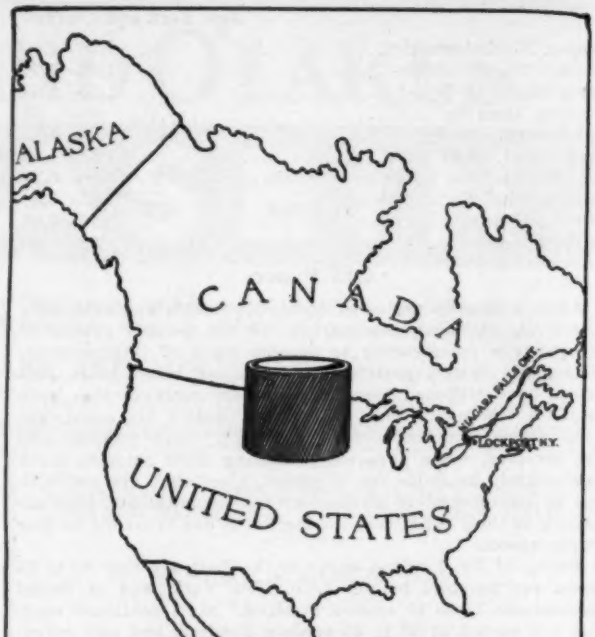

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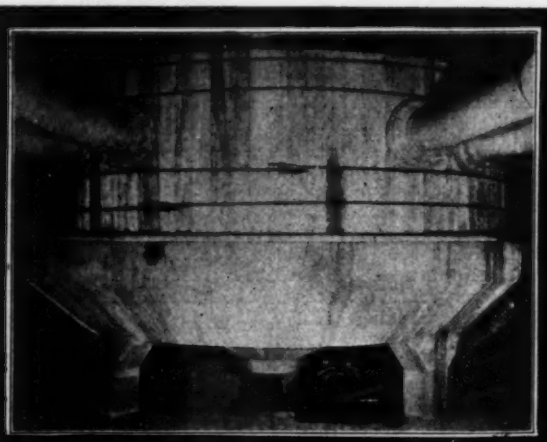

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steady undertone. Producers are not pressing to sell as most of them are now bent on accumulating stocks to tide them over the customary drought season in the late summer and early autumn. The statistical position of the market appears moderately firm.

Canadian grinders are quoting $25 to slightly higher f.o.b. pulp mills for prime groundwood, while domestic pulp is on a price level of around $28 or $29 a ton, depending on the haul to consuming centers and the air dry test. Consumers are said to be meeting the prices named when in want of supplies, thereby indicating that they consider prevailing prices as reasonable.

Production of groundwood in the United States in May amounted to 105,581 tons, compared with 104,066 tons produced by identical mills in the preceding month, according to the American Paper and Pulp Association. Stocks at producing mills at the end of May totaled 95,937 tons, against 80,115 tons a month earlier.

Chemical Pulp

Not much activity is noted in the chemical wood pulp market. There is, of course, a certain amount of routine buying being done by consumers, and there is also a steady movement of supplies on contracts, but fresh demand is of narrow scope and is having scant influence on the situation in general, nor is it affecting market values. Prices seem a bit steadier than they were, with producers contending that the decline has spent its force and that market levels now are about as low as will be seen. Bleached sulphite of Pacific Coast origin is offered on a price basis of 3 cents a pound ex dock at Atlantic seaboard, whereas other grades of such pulp are quoted all the way up to 4.50 and 4.75 cents a pound f.o.b. producing mills. Unbleached sulphite of book grade is around 2.75 cents a pound at pulp plants, and of newsprint quality about 2.50 cents. Kraft pulp is quoted at 2 cents or lower for the southern product and at 2.75 cents and higher for eastern kraft.

Mills in the United States produced a total of 129,837 tons of chemical pulp during the month of May, contrasted with 130,234 tons for the identical mills in the preceding month, the American Paper and Pulp Association reports. Stocks at pulp mills at the end of May amounted to 26,103 tons of all grades of chemical, against 26,113 tons at the end of April last.

Quotations f.o.b. pulp mills are as follows:

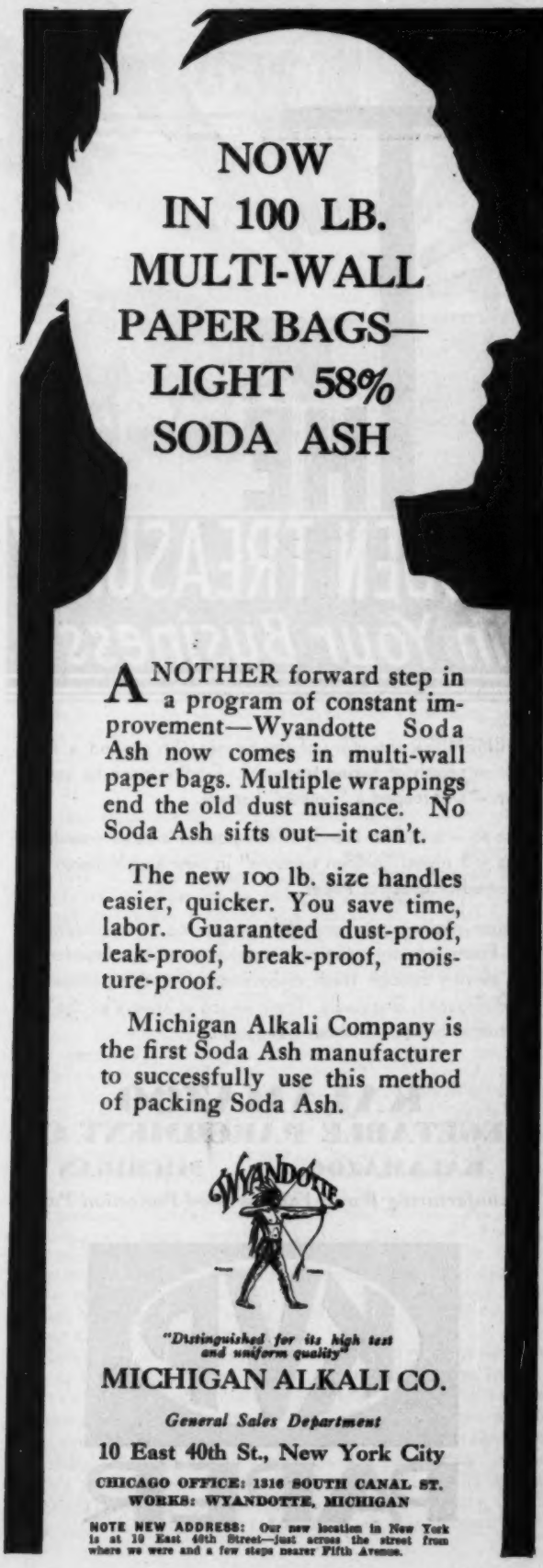
Bleached sulphite	3.00–4.75
Easy bleaching sulphite	2.55–2.80
Unbleached sulphite, No. 1 strong (news grade)	2.35–2.60
Unbleached sulphite, No. 1 book	2.60–2.85
Soda pulp bleached (delivered)	3.20–3.40
Mitscherlich, unbleached	3.00–3.25
Kraft, No. 1	1.90–2.75
Screenings, refined	(nominal)

Chemicals

Principal movement of papermaking chemicals at present is against contracts, with most consumers manifesting little desire for additional supplies. Prices are maintained quotably, though it is possible some concessions are being allowed in certain instances by producers. The quotation on soda ash remains 1.32½ cents per pound for the 58 per cent light product packed in bags f.o.b. works, and caustic is 3.30 cents a pound for the ground product. Casein prices show little or no change on a range of 13.50 to 15 cents a pound, duty paid on the imported article. Brimstone is quoted steadily at $18 to $20 a ton at mines.

Average quotations are as follows:

Alum, lump ammonia	3.50 – 3.75
Alum, lump starch	3.75 – 4.00
Blanc fixe, powdered	3.75 – 4.00
Bleaching powder	2.00 – 2.35
Brimstone (long ton, at mine)	18.00 –20.00
Casein (duty paid)	13.50 –15.00
Caustic soda, spot delivery	3.30 – 3.35
China clay, domestic washed	8.00 –13.00
China clay, foreign	15.00 –21.00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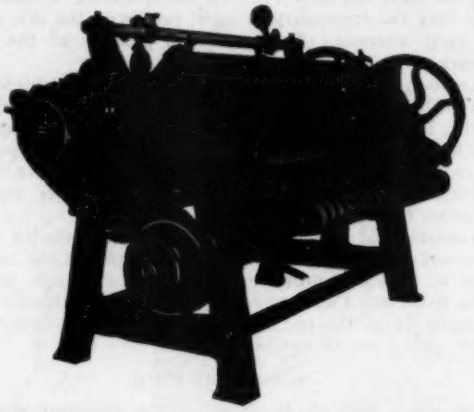

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White rag	15–40
White sulphite	9–30
Colored rag	15–40
Colored sulphite	8–30
Ledger—	
White rag	16–40
Colored sulphite	10–30
Colored sulphite	8–30
Colored rag	15-40
Bond—	
White rag	16–40
White sulphite	8–30
Colored sulphite	8–30
Colored rag	15-40
Book—	
No. 1 S. & S. C.	5.75– 8.00
Machine finished	5.50– 8.00
English finish	5.50– 8.00
Coated and enameled	7.50–12.00
Lithograph, M. F.	7.50–12.00
Newsprint—	
Rolls, contract, per ton, delivered New York	62.00–
Rolls, transient, per ton, delivered New York	62.00–
Sheets, per ton, delivered New York	67.00–
Side runs, per ton, delivered New York	47.00–52.00
Cover Stock—	
Coated, both sides	–10.25
Coated, one side	–10.15
Tissue—	
No. 1 white, 20x30	.75– .90
No. 2 white, 24x36	.75– .90
No. 1 Manila, 24x36	.75– .80
Kraft	.95– 1.10
Wrapping—	
No. 1 kraft	5.75– 6.25
No. 2 kraft	3.50– 4.50
Southern kraft	3.50– 4.00
Boards—	**New York and Chicago**
Solid news	37.50–40.00
Straw	50.00–55.00
Plain chip	35.00–37.50
White coated chip	50.00–55.00
Manila coated chip	45.00–50.00
Binder's board	65.00–70.00

Chemicals

(Continued from page 935)

Rosin, Grade E	5.80 – 5.85
Satin white	2.00 – 2.25
Soda ash, 58 per cent light (bags)	1.32½–.....
Starch, papermakers', in bags	3.72 –.....
Talc (ton)	16.00 –18.00

International Filter Co. and associated companies, International Water Softener Co. and General Zeolite Co., Chicago, announce that expansion of their manufacturing facilities has necessitated the removal of their general officers and engineering departments from plant No. 1 at 333 West 25th Place, Chicago, to larger quarters at 59 East Van Buren Street, Chicago.

Bureau of Dairy Industry Offers to Aid Casein Manufacturers

Casein, a milk by-product which is increasing in economic importance to the American dairy industry, is used in the United States to the extent of about 50,000,000 pounds a year, of which it is estimated 75 per cent is used by the paper industry. More than half of this amount is imported. The Bureau of Dairy Industry, U. S. Department of Agriculture, is in position to assist American manufacturers of casein in putting into practice methods of manufacture which will enable the American product to compete more successfully with the imported product in the domestic market. The bureau desires to render this service to the industry, announces O. E. Reed, chief of the Bureau of Dairy Industry.

"The amount of casein we import annually, represents approximately a billion pounds of skim milk," says Mr. Reed. "If all the casein used in this country were made in the United States, our dairy producers and dairy manufacturers would find an industrial outlet for an additional 1,000,000,000 pounds of their skim milk.

"Some of the largest industrial users of casein have said that they have found the imported casein more satisfactory than the domestic product. One of the criticisms of the domestic casein was that it lacks uniformity as to adhesiveness, solubility, viscosity, ash content, and other properties. The manufacturers said that this lack of uniformity as between different lots is very troublesome to the user of the American casein, because he must test each lot and must modify his formulas to suit the properties of each particular lot.

"Also, criticism is being directed against some of our domestic casein on the ground of quality," says Mr. Reed. "Some of the domestic product is not what it should be, and this is because there is need for improvement in the manufacturing practice in some of our factories. A good deal of the casein made in this country is as good as that made in any other country, but, considering American production as a whole, the average product lacks the uniformity of grade and quality which the buyer demands. These defects can be eliminated and the casein market can be improved if all factories will adopt the best methods of manufacture, standardize upon these methods, and establish definite grades for their product so the buyer can specify a grade and get exactly what he wants."

The Bureau of Dairy Industry has developed in its research laboratories a method for producing a "grain-curd" casein of very high quality and uniformity. "The casein manufactured under the bureau's method," says Mr. Reed, "has been meeting the requirements of users of casein who must have a high-grade product. It is low in ash, high in adhesiveness, dissolves readily, and the solution has a low viscosity and good spreading qualities, properties of special importance to manufacturers of coated paper, the largest users of casein in this country. The principal use of casein in paper manufacture is to bind clay to the fibrous base of the paper, the clay, when rolled between hot roller giving the paper a smooth printing surface.

"The Bureau of Dairy Industry can show manufacturers how to turn out a casein high in grade and uniform in quality," says Mr. Reed, "and is now ready and willing to demonstrate in casein factories of the United States the method of manufacture which will yield high-grade casein that runs uniform. This method is known as the 'grain-curd' method.

"We invite casein manufacturers to write to the Bureau of Dairy Industry U. S. Department of Agriculture, Washington, D. C., for further information on this subject."

QUALITY PULPS

"HAFSLUND BEAR"
Bleached Sulphite

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Aktieselskabet Greaker Cellulosefabrik, Greaker Norway

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EXPORTS

Exportation of paper and paper products from the United States in May recorded a decline in point of total value as compared with the preceding month, and also were below the exports in the corresponding month last year, according to official statistics compiled and issued by the U. S. Department of Commerce in Washington. The May exports reached a total value of $2,757,701, contrasted with shipments aggregating in value $2,866,159 in April this year, and $2,818,743 in May, 1929. Exports during the first five months of the current year totaled in value $14,239,225, also registering a decrease as compared with shipments abroad of a value of $15,912,781 in the similar period a year ago.

Exports of newsprint from the United States declined from 2,046,119 pounds of a value of $98,287 in April last to 1,316,582 pounds of a declared value of $48,327 in May, while uncoated book paper exports in May amounted to 2,930,535 pounds of a value of $197,626, as against exports of a value of $250,236 in the preceding month. Exports of wrapping paper also declined to 3,224,079 pounds, valued at $186,843, in May, against shipments of a value of $242,567 in April, whereas exports of writing paper increased from a value of $209,468 in April last to 2,033,353 pounds of a value of $228,096 in May. Sheathing and building paper was exported in May to the value of $54,730, against $71,788 in the preceding month.

Boxboard of paperboard and strawboard exports in May were valued at $188,092, showing a gain from the shipments of a value of $117,344 in April, while exports of other paperboard reached a value of $184,338 in May, contrasted with $140,597 in the preceding month.

IMPORTS

Wood Pulp

There is limited trade activity developing in imported wood pulp, according to reports. Paper and board manufacturers in a great majority of cases exhibit little disposition to operate as buyers, and in quite a few instances are still more intent on reducing their holdings of pulp either by using up the stock themselves or else finding buyers for a portion of their pulp which they do not need, than they are on augmenting their purchasing commitments. There are exceptions, of course, and in some few cases consumers, who presumably feel that prevailing prices of pulp are about as low as will be seen for a while and that consequently now is a favorable time for them to buy, are looking ahead and placing orders for supplies a far ways off—chiefly for shipment from primary sources abroad during 1931. However, the buyers who are operating are doing so cautiously, are contracting for rather limited tonnage, and are insisting on prices at the low edge of quotational ranges or slightly less.

Despite the quietness of the market, it would appear as if prices of chemical pulp have steadied. Certainly the sharp downtrend that was noted in values for sometime has been checked; very little further change has been recorded during the past month, and prices seem to be resting on something approaching stabilized levels. Whether there will be another recession remains to be seen, but it is apparent that producers in Scandinavia and elsewhere in Europe are resisting with increased vigor any additional fall in prices, and are contending that present market rates are, in some cases, below actual production costs. Moreover, the argument is advanced that this price situation cannot long endure; that unless the market improves and prices revert to more favorable levels a good many mills will curtail output, which ultimately will lead to higher prices.

On the other hand, it is no secret that substantial stocks of pulp are available to buyers, not only at primary centers in Europe but also in the United States. Exceptionally heavy importations early this year, coming just when activity in the paper industry decreased and consumption of wood pulp declined, resulted in the piling up of stocks at American Atlantic ports which perhaps reached a larger volume than has been ever before known. Various estimates have been made, but it seems safe to state that at one time there was approximately 150,000 tons of chemical pulp in store or on the docks on the Atlantic seaboard, the great bulk of which constituted surplus supply. It is probable that meantime these stocks have been reduced, but there is no gainsaying that available supplies continue heavy, and that it is likely it will take sometime to use up present stocks and bring the market back to a more normal statistical position.

Imports of chemical pulp into the United States in May showed a moderate gain over the preceding month's receipts, but were far under the record-breaking importations in the first two months of the current year. The May imports amounted to 89,505 long tons of all grades of chemical pulp, valued at $5,104,881, according to official U. S. Department of Commerce statistics, contrasted with 82,612 tons of a declared value of $4,832,172 imported in April this year, and 106,919 tons of a value of $6,311,930 in May last year. The May receipts brought the total for the first five months of this year up to 575,891 tons, valued at $32,742,220, or a monthly average of 115,891 tons, as compared with 533,988 tons of a value of $31,094,582 in the corresponding period a year ago, or an average of 106,797 tons per month. This year's imports therefore registered an increase of 41,903 tons over last year's in the similar period. The heavy arrivals this year are accounted for principally by the large imports in January and February last, when 153,092 tons were imported in the first month of the year and 169,645 tons in February, the receipts in these two months comprising 54 per cent of the total imports in the first five months of the current year. Thus, in spite of the very large arrivals in the first couple of months of this year, the decrease during the subsequent three months brought the average monthly importation during the five-month period down to below the monthly average for all of 1929—an average of 120,092 tons per month having been established last year—so that it can be said that importations now are on a more reserved scale.

Imports of mechanical pulp into the United States in May were 15,564 long tons, valued at $432,349, against 18,423 tons of a value of $472,200 in the preceding month, and making a total for the first five months of this year of 118,441 tons, valued at $3,317,884, against 90,087 tons of a value of $2,286,761 in the same time last year.

Prices of strong unbleached sulphite display fair steadiness on a level of 2.40 to 2.50 cents a pound ex dock New York or other American Atlantic ports with extra qualities quoted beyond these figures. Bleached sulphite is relatively unsettled quotably at about 3.10 cents upward a pound ex dock for prime grades, with prices ranging all the way up to 4.25 cents for certain mill brands, according to quality. Prime easy bleaching sulphite is available at around 2.70 cents ex dock, and ordinary Mitscherlich sulphite of German

Morey Paper Mill Supply Co.

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They Lie Flat—And Run Straight

Even At High Speed

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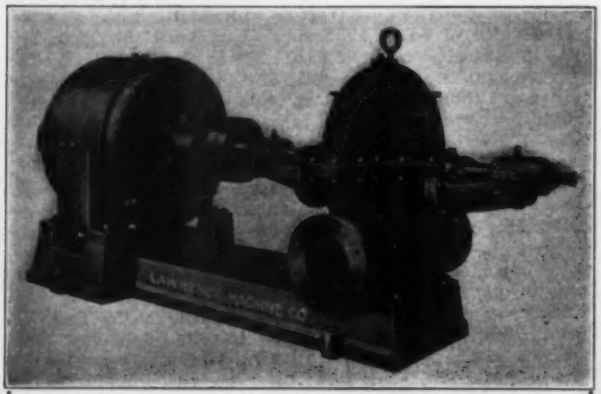

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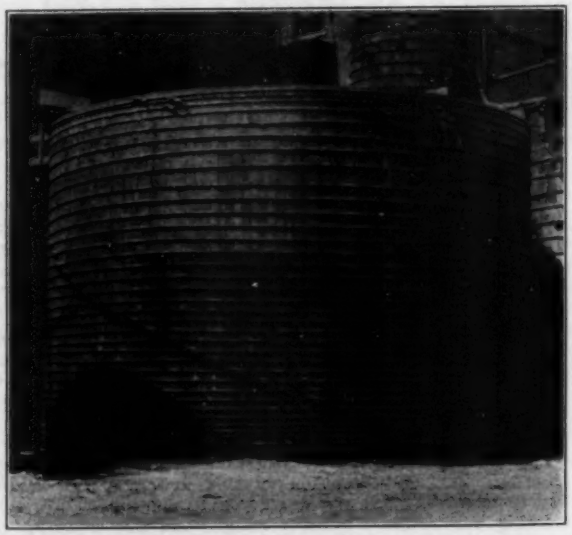
WOOD TANKS TILE



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Tank Builders Since 1867

KALAMAZOO TANK AND SILO CO.

KALAMAZOO, MICHIGAN

origin at 2.40 cents. Kraft pulp is quoted by most importers and agents at 1.75 cents a pound ex dock, though it is said purchases are possible in some quarters down to 1.65 cents. Kraft values are comparatively soft, due, it would seem, to the fact that mills in Scandinavia are not as well sold up on such pulp as they are on sulphite. Moreover, the southern kraft situation in the United States is affecting demand for and prices of Swedish kraft pulp, and doubtless is responsible in good measure for the drastic decline that has been seen in prices of the imported product in the last few months. Producers in Sweden apparently are recognizing the seriousness of this competition, and have lowered their prices so as to be able to compete with southern kraft.

Current market quotations ex dock New York are as follows:

Bleached sulphite, No. 1	3.00– 4.25
Unbleached sulphite, strong No. 1	2.40– 2.65
Unbleached sulphite, No. 2	2.20– 2.40
Easy bleaching sulphite	2.60– 2.80
Mitscherlich unbleached, genuine	2.85– 3.00
Mitscherlich unbleached, ordinary	2.40– 2.60
Kraft, standard Swedish	1.65– 1.85
Groundwood, per ton (dry)	32.00–33.00

Paper Stock

Judging from the statistics for May—the last month for which official figures are available—importations of rags for papermaking are on the decline, as might be expected in view of the market condition existing in the United States in recent months. May imports of papermaking rags reached a total of 30,333,061 pounds, valued at $574,174, contrasted with 36,888,998 pounds of a value of $916,400 in the preceding month and 43,643,859 pounds of a value of $935,310 in the corresponding month last year. Also, the figures for the first five months of this year show that rag imports registered a decrease as compared with a year ago, the five-month receipts this year amounting to 165,783,090 pounds, valued at $3,479,514, contrasted with 170,666,008 pounds of a declared value of $3,405,395 in the similar time of 1929. The probabilities are, according to expressions of opinion in the importing trade, that the statistics for subsequent months will show a further decline in rag imports, as the price condition in the last several months has been so unfavorable that purchases abroad have been reduced substantially. In fact, importers assert that they have been obliged to curtail sharply their buying owing to rag costs in most foreign sources being so far beyond a parity with ruling market values in this country.

Imports of waste bagging and waste paper, figures covering both materials being combined by the Government, also show a decrease this year as compared with 1929. Imports during the first five months of the current year amounted to 51,550,561 pounds, valued at $597,678, against 57,448,481 pounds of a value of $699,143 in the same period a year ago. On the other hand, importations of old rope and other miscellaneous paper stock in the five-month period scored a gain this year over last year, totaling 57,596,589 pounds of a value of $1,097,727, contrasted with 44,581,156 pounds of a value of $1,361,415 a year ago. This increase may be attributed chiefly to the rise in old rope receipts, imports of this papermaking material having run fairly heavy this year.

Paper

Notwithstanding the general fall in importations of nearly all commodities into the United States this year as compared with 1929—it being reckoned that the decline in aggregate imports has been fully 20 to 25 per cent—imports of paper and paper products have held up comparatively well, judging from Department of Commerce statistics covering the first five months of 1930. Imports of paper in the five-month period reached a total value of $62,059,431, as compared with imports of a declared valuation of $63,824,953 in the corresponding time of 1929. This shows a decrease, but a slight one only or roughly a fall of about 3 per cent.

Imports of standard newsprint during the first five months of this year were of larger volume than a year ago in the

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MILWAUKEE, WIS. U.S.A.

same time, but recorded a drop in value. Receipts last year were 1,858,635,577 pounds, valued at $56,381,909, while in the first five months of 1930 imports were 1,867,773,470 pounds of a declared value of $54,489,531. Newsprint imports comprised, of course, the great bulk of paper importations into the U. S. in the first five months of the current year, with imports from Canada amounting to 1,681,294,330 pounds, valued at $49,691,311, of the total.

The next most important class of paper imported into the United States in the first five months of 1930 in point of value was cigarette paper, receipts of which reached 5,308,416 pounds, valued at $1,833,583, compared with 5,061,361 pounds of a value of $1,653,635 imported in the same period a year ago. Imports of tissue and copying papers in the five-month period this year amounted to 1,919,704 pounds, valued at $1,034,901, against 1,812,428 pounds of a value of $971,385 last year, while imports of paper boxes amounted in value to $585,987 this year, contrasted with $646,029 in the first five months of 1929.

Importations of kraft wrapping paper during the first five months of the current year were valued at $155,992, against $159,861 last year, and of other wrapping paper $61,208, contrasted with $92,307 in 1929. Writing, letter, drawing and other fine paper imports in the first five months of 1930 were valued at $417,071, against $318,218 last year, while surface-coated paper imports declined from a value of $479,111 a year ago to $379,173 this year. Imports of pulpboards in rolls in the five months reached a value of $541,516 this year, compared with $580,851 last year, and receipts of other paperboard, pulpboard and cardboard were valued at $163,857 in the first five months of the current year, against $223,022 a year ago.

Foreign Trade Opportunities

The following foreign trade opportunities are issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce. Those interested are requested to communicate with the Bureau at its offices in Washington or New York or its branch offices in other cities, in every case mentioning the number of the inquiries referred to.

No. 46163—Roofing felt, asphaltic. Nerchau, Germany. Agency desired.

No. 46248—Envelopes, white. 6½ by 3⅝ inches, 300,000. Penang, Straits Settlements. Purchase desired.

No. 46129—Toilet paper in rolls, cheap, Rio de Janeiro, Brazil. Sole agency desired.

No. 46176—Felts, endless, for paper manufacture. Helsingfors, Finland. Agency desired.

No. 46357—Bonbon cups, candy wraps, and waxed paper. Melbourne, Australia. Agency desired.

No. 46359—Check paper, safety type. Sao Paulo, Brazil. Agency desired.

No. 46378—Stationery, for offices. Guayaquil, Ecuador. Agency desired.

No. 46323—Wallboard, insulating fiber. London, England. Sole agency desired.

No. 46327—Waste paper, rags, old ropes, hemp and jute wastes and other papermaking materials. Hamburg, Germany. Agency desired.

No. 46427—Tissue paper for wrapping pineapples. Artemisa, Cuba. Purchase desired.

No. 46489—Caustic soda. Winnipeg, Canada. Purchase desired.

No. 46618—Crepe paper towels, and paper dusting pads. Hamburg, Germany. Purchase and agency desired.

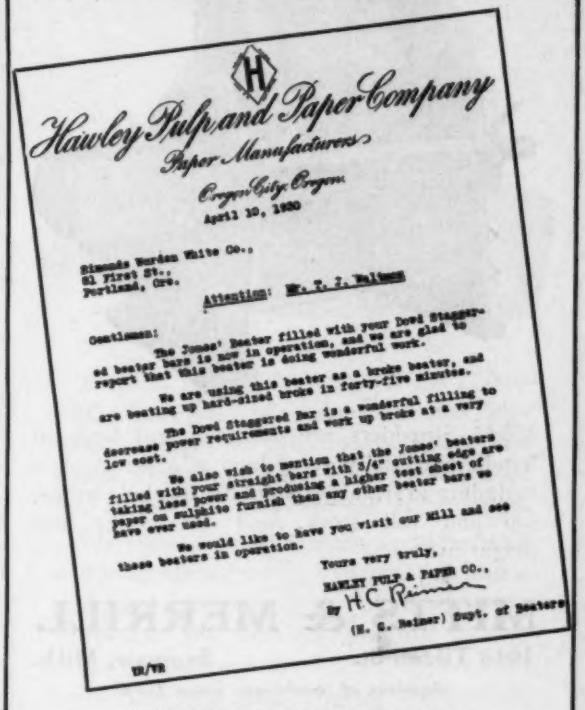
No. 46613—Vulcanized fiber. Hamburg, Germany. Agency desired.

No. 46614—Chemical pulp and other raw materials for paper mills. Milan, Italy. Agency desired.

The Brown Instrument Co., Philadelphia, announces with regret that George W. W. Cornman, treasurer and manager of its service department has retired from business. The service department is now in charge of R. C. Kennan as manager, and E. T. Nahill as field supervisor.

Let the Experience of Others

Be Your Guide to Better Beater Performance


Hawley Pulp and Paper Company
Paper Manufacturers
Oregon City, Oregon
April 10, 1930

Simonds Worden White Co.,
61 First St.,
Portland, Ore.

Attention: Mr. T. J. Nelson

Gentlemen:

The Jones' Beater filled with your Dowd Staggered beater bars is now in operation, and we are glad to report that this beater is doing wonderful work.

We are using this beater as a broke beater, and are beating up hard-sized broke in forty-five minutes.

The Dowd Staggered Bar is a wonderful filling to decrease power requirements and work up broke at a very low cost.

We also wish to mention that the Jones' beaters filled with your straight bars with 3/4" cutting edge are taking less power and producing a higher test sheet of paper on sulphite furnish than any other beater bars we have ever used.

We would like to have you visit our Mill and see these beaters in operation.

Yours very truly,
HAWLEY PULP & PAPER CO.,
By H C Reimer
(H. C. Reimer) Supt. of Beaters

HR/VR

THE DOWD STAGGERED BAR
(Patented)

Designed to increase circulation, suction and breaking up of stock. Reduce friction, lessens liability of burning and shows an appreciable saving in horsepower and labor.

THE CORRUGATED BAR
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Much stronger than the ordinary bar because of its corrugated design. Unusually efficient because of the brushing action afforded by the corrugations.

STANDARD STRAIGHT BARS

For all ordinary beating requirements this bar will produce a better furnish in less time than any other similar bar. SWW will gladly furnish full information on the above bars, and on Erosion-Resisting, Manganese Steel, and other qualities for specific requirements.

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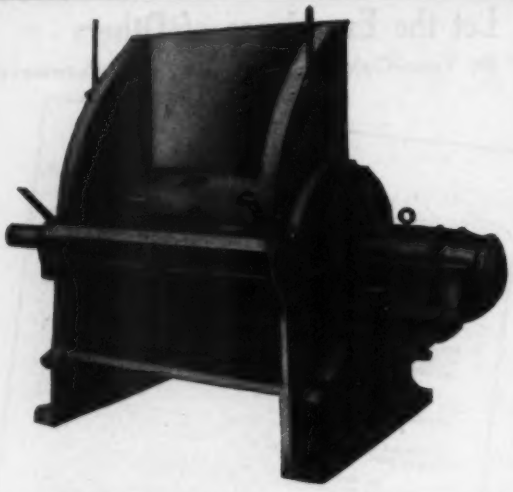

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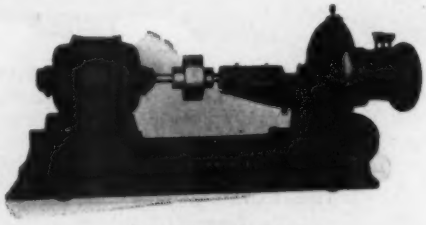

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We also make a screw **agitator pump** for use in successfully **agitating** the present day high consistencies of stock.

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Deterioration of Newspapers

Through the co-operation of the New York Public Library, the Paper Section of the National Bureau of Standards has been able to make a study of old newspapers in reference to their state of preservation. The transitions in usage of the various papermaking fibers are well reflected in newsprint papers, therefore papers used for this purpose are a valuable medium for obtaining information on the natural aging properties of the various kinds of fibers.

At the request of the bureau, the New York Public Library submitted test specimens taken from newspapers in their files dating from 1830 to 1895. Nineteen different newspapers were examined, and sufficient determinations of the kind of fibers present were made to find the various transitions in usage of fibers, and to find the relation of these transitions to the aging quality of the papers.

The papers were first graded jointly by three persons, with consideration of color and strength. Five different grades were observed, therefore the best grade was designated No. 1 and the poorest grade No. 5, the others falling in order between these grades. The No. 1 papers were in excellent condition, showing little or no evidence of deterioration in color and strength. The papers of No. 5 grade were very badly deteriorated. They had a deep brown color and were very weak, usually breaking with one fold. After the papers were graded, the kinds of fibers present were determined, and the condition of the fibers was noted. Following is a summary of the results of these examinations.

To 1865, the papers are composed of chemically-purified rag fibers and are generally in excellent condition. Of the twenty-eight specimens of this group examined, thirteen were rated No. 1 in color and strength, eight were rated No. 1 in strength and No. 2 in color, and the remaining seven were rated variously Nos. 2 to 3 as to color and strength.

From 1865 to 1873, the papers are generally composed of chemically-purified fibers from rags, wood, straw and esparto grass, usually mixed, and are generally in good condition. This group consisted of fifteen specimens, ten of which were rated No. 1 in both color and strength. Of the No. 1 papers, seven consisted of various rag-straw or rag-esparto mixtures, one was composed largely of wood and straw with a small admixture of rag, and two were composed entirely of esparto or straw. Differentiation between esparto and straw is sometimes difficult, and while the fibers of these two papers appeared to be esparto, the identification of the source of the fibers was not positive. The remaining five papers had fiber mixtures similar to the other papers of this group, and their ratings in color and strength ranged from 2 to 4. Papers in the group extended to the year 1881.

The remainder of the specimens, forty-two in number, all contained groundwood fiber. The earliest date of papers in which groundwood was found is 1868, but it was not generally present in papers dated prior to 1873. The papers of this group were with a few exceptions, badly deteriorated, generally having a deep brown color and crumbling to pieces with very little handling. Only one paper was rated No. 1 in color and strength, and it was composed largely of either straw or esparto grass fibers with a small proportion of groundwood fibers. Five papers were rated No. 2 and consisted of various mixtures of the chemically-purified fibers, such as found in the previous group, mixed with groundwood fibers. The remainder of the papers were with few exceptions rated No. 4 or 5. The use of chemically-purified fibers from rags, straw, esparto and wood, mixed with the crude groundwood fibers apparently continued until around 1890, at which time occurred the transition to the modern type of newsprint, consisting of approximately 30 per cent of unbleached wood sulphite fibers and 70 per cent of groundwood fiber.

Aside from their historical interest, these data give additional evidence of the superiority of well-purified fibers over crude or partially-refined fibers. The permanence of these papers that are composed of highly-refined fibers, whether from rags, straw, esparto grass or wood, is very good, but starting with the introduction of the crude groundwood fibers, the papers are generally badly deteriorated, whether the groundwood fibers are associated with these highly refined

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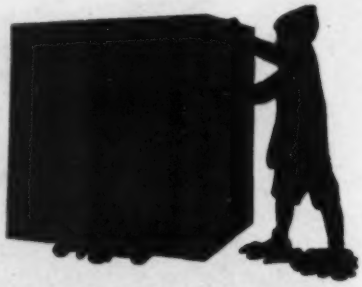

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ABSOLUTELY NO FELT MARKS IN PAPER

TRIUNE Three Ply Felts for extra long service and large production

fibers, or with only partially refined fibers such as unbleached sulphite wood fibers. These findings are further evidence that the processing of fibers is a more important factor in their aging quality than is their source.

Effect of Tub-Sizing on Strength of Papers

An analysis of the effect of tub-sizing on the strength of the highly-purified wood fiber papers made in the Bureau of Standards mill indicates the following: The folding endurance is increased, on the average by about 10 per cent. The bursting and tensile strengths are increased in the case of the waterleaf sheet, by about 30 per cent; the paper sized with ½ per cent rosin is increased in strength by about 20 per cent; and that sized with 1 per cent rosin is increased in strength by approximately 15 per cent. The tearing strength alone undergoes a decrease on sizing, and this decrease is roughly in proportion to the amount of glue or starch taken up. All of these effects are about the same regardless of whether the sizing medium is glue or starch.

Acidity of Tub-Sized Papers—Acidities of papers made in the Bureau of Standards mill have been determined by both the Kohler-Hall extraction method, and by a method used at the Bureau of Standards in which a suspension of the ground paper is swept free of CO_2 and titrated in the presence of the fibers. The Kohler-Hall method permits determination of the external acidities of the tub-sized papers. In this determination 10 grams of paper in the form of ½" squares is boiled for 2 minutes in 250 c.c. of water. The extract is decanted, cooled and titrated with N/100 NaOH. It is presumed that this method of extraction dissolves off merely the surface sizing materials and acids contained in them, leaving the acids in the basic paper undissolved. Thus the internal acidity or the acidity of the basic paper is arrived at by subtracting the external acidity from the total acidity. Hall observed the fact that external acidity is relatively harmless. This is in agreement with work since done at the Bureau. Since the acidity of the basic papers used in the Bureau tub-sizing runs were known, it was possible to estimate the accuracy of the above-mentioned method. The following tabulation of results obtained on papers tub-sized with the glue containing alum (pH of solution 4.2) indicates that the tub-sized waterleaf has an apparent external acidity considerably lower than the true value, undoubtedly because of the penetration of the glue and alum into the absorbent sheet, and the subsequent difficulty of obtaining complete extraction. On the other hand, in the case of the rosin-sized papers, the glue remains more or less on the surface and as it is much more readily extractable, the test results for external acidity are in good agreement with the true values.

Acidities of Paper Tub-Sized with Glue and Alum (Kohler-Hall)*

Basic Paper	Total Acidity (Three 1-hour extractions of disintegrated paper)	External Acidity (One 2-minute extraction of ½ inch squares of paper)	Internal Acidity (Total Minus External)	Internal Acidity (Actual value; i.e., total acidity of papers before tub-sizing)
Waterleaf	.032	.010	.022	.006
Engine-sized ½ per cent rosin	.046	.012	.034	.031
Engine-sized 1 per cent rosin	.058	.014	.044	.048

*Expressed in per cent SO_3.

Acidities as determined by the direct titration of fiber suspensions are approximately double those obtained by the Kohler-Hall method. The former method undoubtedly indicates more accurately the actual titrable acidity, but provides no means for estimating external acidity.

The Poole Engineering & Machine Co., Baltimore, Md., has appointed Neil Otey as district manager of its Pittsburgh office, with headquarters at 245 Union Trust Bldg.

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Definite Advantages

You will find the Orr a better water extractor—reducing the work for the dryers to a minimum.

You will find that Orrs last longer—reducing the annual felt bill by many hundreds of dollars.

The above statements may very easily be proven—have been proven in mills sufficiently interested to conduct operating tests—first on one make, then on another.

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Complete line in all required sizes and weaves, including endless felts up to 86 feet in length.

The Orr Felt & Blanket Co.,
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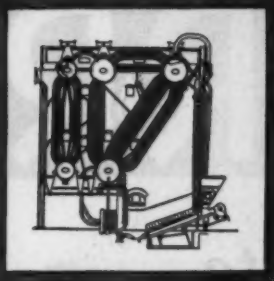
FELTS



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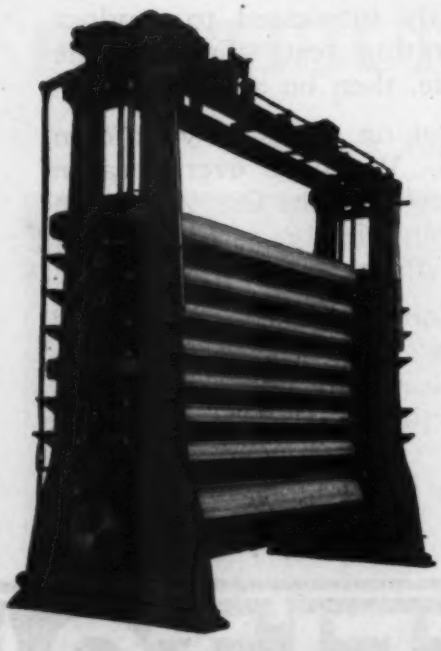

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